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Testing, calibrating, advising.



**Title:**

Global Fire Resistance Assessment  
of:

Strebord® 44 Panelled \  
Strebord® Superpan  
Panelled Doorsets

for:

30 Minutes Fire Resistance

**Valid From:** August 1<sup>st</sup> 2018

**Valid Until:** August 1<sup>st</sup> 2023

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WF403039

Prepared for:

**Falcon Panel Products Ltd.**

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## 1 Introduction

This document constitutes a fire resistance assessment relating to Strebord® 44 Panelled \ Strebord® Superpan, Panelled 30 minute doorsets, for Falcon Panel Products Ltd. The assessment uses established extrapolation and interpretation techniques in order to extend the scope of application by determining the limits for the designs, based on the tested constructions and performances obtained. The assessment is an evaluation of the potential fire resistance performance, if the elements were to be tested in accordance with BS 476: Part 22: 1987.

## 2 General Description of Construction

### 2.1 Strebord® 44

The primary construction for door leaves of this design comprises the following:

- A homogenous solid sheet of 44mm thick Strebord® 44 particleboard (minimum density 520kg/m<sup>3</sup> to maximum density 630kg/m<sup>3</sup>). Where required, to be routed to create mock panels and are to be lipped with hardwood.

### 2.2 Strebord® Superpan

The primary construction for door leaves of this design comprises the following:

- A homogenous solid sheet of 44mm thick Strebord® particleboard (minimum density 560kg/m<sup>3</sup>) with nominal 3mm thick integral outer MDF facings, fully bonded with a PVA adhesive, incorporated during the manufacturing process (factory applied). Where required, to be routed to create mock panels and are to be lipped with hardwood.

### 2.3 Strebord® 54

The primary construction for door leaves of this design comprises the following:

- A homogenous solid sheet of 54mm thick Strebord® 54 particleboard (minimum density 520kg/m<sup>3</sup> to maximum density 630kg/m<sup>3</sup>). Where required, to be routed to create mock panels and are to be lipped with hardwood.

It is the opinion of Exova Warringtonfire that based on the test evidence listed in Appendix A, the construction options below available for each door leaf design can be applied to either of the door leaf designs in sections 2.1 - 2.3, unless otherwise specifically stated herein.

Element		Material	Dimensions (mm)	Density (kg/m <sup>3</sup> )
Stiles and rails		None fitted	-	-
Core		Falcon Strebord Particleboard	44 thick reduced to 24 thick at mock panel areas*	Min 530 to Max 630 <sup>3</sup>
Panel facings <sup>1</sup>		Hardboard MDF	Min 3 thick	900 <sup>2</sup> 700 <sup>2</sup>
Panel beading (optional)		Softwood	8 high x 10 deep	510 <sup>2</sup>
Beading fixings		Steel pins	30 long fitted 50 from corners at 150 centres	-
Adhesive	Lipping	PVA/PU/UF	-	-
	Panel facing	PVA/PU/UF	-	-
Lippings – vertical edges only		Hardwood	6 thick	530 <sup>2</sup>

**Notes:**

- 1 See section 8 for full details on panel dimensions and construction
- 2 Nominal density
- 3 Tested density range.

### 3 Leaf Sizes

The approval for increased leaf dimensions is based on the tests listed in Appendix A and takes into account the margin of over-performance above 30 minutes integrity for the design and the characteristics exhibited during test. Data sheets specifying the maximum approved leaf sizes and graphs showing the permitted gradient between maximum height and width are contained in Appendix E.

Doorsets with reduced dimensions are deemed to be less onerous. Therefore, doors with dimensions that are less than those tested and stated in Appendix E may be manufactured.

### 4 Configurations

Based on the test evidence listed in Appendix A, this assessment covers the following doorset configurations.

Abbreviation	Description
LSASD & ULSASD	Latched & unlatched, single acting, single doorsets
DASD	Double acting, single doorsets
LSADD & ULSADD	Latched & unlatched, single acting, double doorsets
DADD	Double acting, double doorsets

Unequal leaf double doorsets are covered by this assessment with no restriction on the smaller leaf dimension.

## 5 Leaf Size Adjustment

The Falcon Panel Products Ltd. Strebord® 44 Panelled \ Strebord® Superpan Panelled door leaf designs referred to in section 2 of this assessment may be altered as follows.

Element	Reduction
Leaf	The manufactured size of the leaf may be reduced in height or width without restriction.
Lipping	Lippings may be adjusted by a maximum of 3mm post-manufacture for on-site fitting purposes, providing a minimum thickness of 6mm of lipping is maintained.

## 6 Variation to Construction

Assessment of variation to the tested designs is permitted within the following parameters:

1. A minimum of 1 and a maximum of 10 panels may be included, subject to section 7 (leaf framing) & 8 (panel construction)
2. Panels must be constructed in accordance with the details in section 8 (panel construction)
3. Panels may be flat or raised and profiled, subject to the minimum thickness detailed in section 8 (panel construction)
4. A maximum glazed area of 0.7m<sup>2</sup> may replace solid panels, subject to sections 7 (leaf framing) and 11 (glazing).

## 7 Leaf Framing

The minimum leaf framing specification for Strebord® 44 Panelled /Strebord® Superpan Panelled doorsets (where applicable) is as follows.

Element	Minimum Dimensions (mm)
Head, stiles and rails	100
Mid rails, muntins and other intermediate framing	80 <sup>1</sup>
Bottom Rails	170
Mid rail - for leaves larger than assessed for single panels	160

**Note 1** Maximum panel sizes are limited by the single panel test evidence generated in RF11160, for larger leaf sizes this may necessitate the use of intermediate framing of greater than the stated minimum dimensions, given above.

## 8 Panel Construction

Construction of panels for Strebord® 44 Panelled / Strebord® Superpan Panelled doorsets must be to the following specification.

Core		Facing			Leaf
Thickness (mm)	Product	Thickness (mm)	Product	Minimum Density (kg/m <sup>3</sup> )	Maximum Dimensions (mm)
24	Strebord®	3	MDF Chipboard Hardboard	700 680 1000	All (Appendix E)

### Notes:

1. Facing materials must be bonded to the core using PVA/PU/UF adhesive
  2. Additional planted beads/mouldings may be fitted as required
  3. Additional decorative/protective facing options are detailed in section 10
- A diagram of the panel construction is contained in Appendix B.

## 9 Overpanels

### 9.1 Solid

Overpanels of the same construction as the door leaves may be used with this doorset design. A transom of the same section and material assessed for the door frames (see note under the table in section 13) must separate the leaf head(s) from the overpanel and the overpanel must be fully contained by the door frame (see following diagram).

Door frame joints must utilise be mortice and tenon or butt joints (see section 13.2).

All methods require joints to be tight, with no gaps, and require mechanical fixing with the appropriate size ring shank nails or screws. Butt joints must be additionally bonded with PVA/PU/UF or equivalent adhesive.

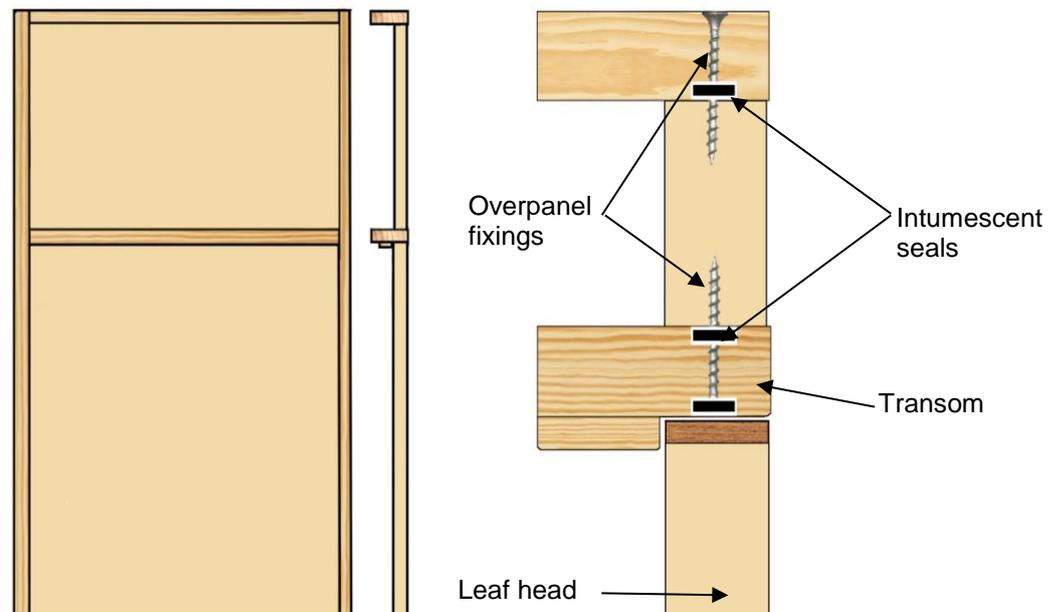
The overpanels must be fixed by screwing through the rear of the frame with steel screws passing at least 30mm into the centre line of the overpanel. Fixings must be no more than 100mm from each corner and a maximum of 250mm centres in between.

The intumescent seals specified for the jambs in Appendix E, must also be fitted to all concealed edges of the overpanel. The seals may be fitted in the overpanel edges or alternatively in the frame reveal. A maximum 2mm gap is permitted between the edge of the overpanel and the frame reveal.

It is permitted to include a glazed aperture within the overpanel providing the glazing is within the parameters given in sections 7 and 11.

Maximum overpanel heights are as follows:

Configuration	Maximum Overpanel Height (mm)
Single doorsets	2000
Double doorsets	1500



**Note:** Drawing is representative of doorset construction only, actual construction must be as the text within this document specifies.

The use of an overpanel frame with a modular construction (i.e. overpanel frame and doorframe being manufactured as two separate items) is acceptable provided the components are fixed together during installation by screwing and gluing the bottom element of the overpanel frame to the door leaf head (forming a double transom). Screw fixings must be a maximum 50mm from the corners and maximum 250mm centres combined with gluing using a UF or PU adhesive. The overall frame section and material must match that given in this assessment for each glass type and glazing specification. Joints must be tight with no gaps. It is permitted to include maximum 3mm (w) x 3mm (d) quirks/pencil rounds at the junction of each timber section.

## 10 Facings

### 10.1 General

The facings for Strebord® 44 Panelled and Strebord® Superpan Panelled are integral with the core construction and therefore alternative materials are not required.

### 10.2 Decorative & Protective Facings

The following additional facing materials are permitted for this door design since they would degrade rapidly under test conditions without significant effect.

Facing Materials	Maximum Permitted Thickness (mm)
Paint	0.5
Timber veneers	2
High Pressure Laminate (HPL)/PVC/Plastic laminates	2
Decorative paper/non-metallic foil	0.5

1. Metallic facings are not permitted except for push plates and kick plates
2. The door leaf thickness may be reduced by a total maximum of 0.6mm to each face (a maximum of 1.2mm in total) for calibration purposes, only in order to accommodate one of the additional facings shown in the table above
3. Materials must not conceal intumescent strips
4. PVC/Plastic laminates may not be applied to the edges of leaves.

### 10.3 Timber Substrate Facings

Strebord® 44 Panelled / Strebord® Superpan Panelled leaves have demonstrated that the application of facings considered structural have not been to the detriment of fire integrity performance. The materials below may be therefore be applied as a facing material using PVA/PU/UF adhesive.

Facing Materials	Maximum Permitted Thickness (mm)
MDF	9

1. Facings may be fixed to the core before or after hardwood edges/lippings are applied
2. Facings must be balanced (i.e. the same thickness and material applied to both faces)
3. Decorative facings in section 10.2 may be applied in addition to timber substrate facings
4. Hardware incorporated into doorset must be capable of accommodating the adjusted weight after additional facings are applied
5. Timber based substrate facings may be routed, recessed or machined in any location provided the requirements of sections 7 and 8 are complied with
6. The maximum thickness of facing allowed on a 54mm leaf is 6mm.

## 11 Glazing

The Strebord® 44 Panelled / Strebord® Superpan Panelled doorset design has not been tested with glazing. Glazing is therefore restricted, based on the largest tested panel area in RF09060, in combination with the successful testing which has been carried out on the Strebord® 44 / Superpan door leaf designs.

The maximum assessed pane size for all configurations is 0.7m<sup>2</sup>.

### 11.1 Assessed Glazing Systems

The glazing system must be one of the following tested proprietary systems.

Glazing System	Manufacturer
1. Fireglaze 30	Sealmaster Ltd.
2. Therm-A-Strip 30	Intumescent Seals Ltd.
3. Firestrip 30	Hodgsons Sealants Ltd.
4. Pyroglaze 30	Mann McGowan Ltd.
5. Norsound Vision 30 (see section 11.8)	Norsound Ltd.
6. System 36 Plus	Lorient Polyproducts Ltd.
7. Flexible Figure 1	Lorient Polyproducts Ltd.
8. R8193	Pyroplex Ltd.
9. 30049	Pyroplex Ltd.
10. 30054	Pyroplex Ltd.
11. Therm-A-Bead <sup>1</sup>	Intumescent Seals Ltd.
12. ST105GT (see section 11.6) <sup>2</sup>	Sealed Tight Solutions Ltd.
13. Intumescent Foam Tape System (see section 11.12) <sup>3</sup>	Sealmaster

#### Notes:

<sup>1</sup> See Report CFR1403122

<sup>2</sup> See Report PF15034

<sup>3</sup> Intumescent Seals Ltd. Therm-A-Bead glazing system may only be used with glass types 9 – 19 as shown in section 11.2.

## 11.2 Assessed Glass Products

Assessed glass types are as follows.

Glass Type	Manufacturer	Thickness (mm)	Max. Area (m <sup>2</sup> )
1 Pyroshield	Pilkington Group Ltd.	6 & 7	0.7
2 Pyroshield 2	Pilkington Group Ltd.	6 & 7	0.7
3 Pyran S	Schott UK Ltd.	6	0.7
4 Pyrostem	Pyroguard UK Ltd	6	0.7
5 Pyroswiss <sup>1</sup>	Vetrotech Saint Gobain	6	0.7
6 ESG Pyrotech 630 <sup>2</sup>	Essex Safety Glass Ltd.	6	0.54
7 Pyrocet XPT <sup>3</sup>	C3S Ltd.	6	0.7
8 Pyroclear 30-001 <sup>4</sup>	Pilkington Group Ltd.	6	0.7
9 Pyroguard EW 30	Pyroguard UK Ltd	7	0.7
10 Pyrobelite 7	AGC Flat Glass UK	7	0.7
11 Pyrodur 30-104	Pilkington Group Ltd.	7	0.7
12 Pyrodur 60-10	Pilkington Group Ltd.	10	0.7
13 Pyroguard EW MAXI	Pyroguard UK Ltd	11	0.58
14 Pyranova 15-S2.0	Schott UK Ltd.	11	0.7
15 Pyrobelite 12	AGC Flat Glass UK	12	0.7
16 Pyrodur 60-20	Pilkington Group Ltd.	13	0.7
17 Pyroguard EI 30	Pyroguard UK Ltd	15	0.54
18 Pyrostop 30-10	Pilkington Group Ltd.	15	0.7
19 Pyrobel 16	AGC Flat Glass UK	16	0.7

### Notes:

1. Pyroswiss product limited to glazing system 3 as defined in section 11.1
2. ESG Pyrotech 630 glass may only be used with the tested glazing system depicted in Appendix D
3. C3S Pyrocet XPT may only be utilised with the tested glazing system as described in section 11.4 below
4. Pilkington Pyroclear may only be utilised with the tested glazing system as described in section 11.5 below
5. Glass types 17 - 19 are fully insulating for 30 minutes in terms of the criteria set out in BS 476: Part 20: 1987
6. All glass types must be fitted fully in accordance with the manufacturers' tested details/installation requirements, particularly with respect to edge cover and expansion clearance.

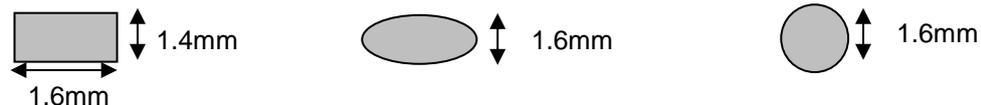
### 11.3 Glazing Beads & Installations

Glazing beads must be as specified in the following table.

Material	Profile	Min. Density (kg/m <sup>3</sup> )	Application
Hardwood	Splayed	640	All proprietary systems detailed in 11.1 and Appendix D
Hardwood	Splayed & Flush	640	Proprietary systems 1 & 2 as specified in 11.1 and all glass types specified in 11.2 (see Appendix D for further details)
Hardwood	Square	640	Proprietary systems 1, 2 & 3 as specified in 11.1 and glass types 9 - 19 as specified in 11.2

#### Notes:

1. Glazing beads must be retained in position with 40mm long steel pins or 40mm long No. 6-8 screws, inserted at 35 - 40° to the vertical, at 150mm maximum centres and no more than 50mm from each corner, or see note 2 below for bead fixings using gun (pneumatically) fired applications
2. Alternatively, the following pin specification has been tested and assessed for steel round, oval and rectangular shaped gun fired pins



Pins with dimensions less than those stated above are not covered by this assessment

3. See Appendix D for square and splayed bead profile options. A 6 - 10mm thick square aperture liner is permitted for use with square beads providing it is constructed from hardwood of minimum density 640kg/m<sup>3</sup> and glued in position using a UF, PVA or PU type adhesive
4. Glazed opening must not be less than 100mm from any leaf edge. Multiple apertures are acceptable within the permitted glazed area, with a minimum dimension of 80mm between apertures
5. Aperture shape is not restricted, providing the glazing system and beads can effectively accommodate the required profile
6. False timber beads may be applied to glass types 9 - 19 using one of the following intumescent glazing products.

Glazing System	Manufacturer
1. Therm-A-Strip 30	Intumescent Seals Ltd
2. Fireglaze 30	Sealmaster Ltd
3. Firestrip 30	Hodgson Sealants Ltd
4. Envirograf Product 77 - G10/10	Intumescent Systems Ltd
5. Intumescent mastic or silicone tested for glazing applications to BS 476: Part 22: 1987 or BS EN 1634-1	Various

All seals must be a minimum of 10mm wide x 0.5 - 3mm thick. Preformed strip systems 1 - 4 may be self-adhesive and grooved into the rear of the glazing bars.

7. Timber for glazing beads must be straight grained, joinery quality, free from knots, splits and checks
8. For alternative glazing bead material specifications, see section 11.9 for Streframe glazing beads and section 11.10 for Morland Quickfix glazing beads.

#### **11.4 Pyrocet XPT Glazing System**

The following system must be used with the Pyrocet XPT glass type listed in section 11.2.

1. Hardwood (minimum density 640kg/m<sup>3</sup>) glazing beads 26mm high x 22mm wide with an 18° chamfer and a 5mm x 5mm bolection return
2. Beads must be retained in position with 50mm long steel pins or 50mm long No. 6 - 8 screws, inserted at 35 - 40° to the vertical at no more than 50mm from each corner and at 150mm maximum centres. Pneumatically fired pins are acceptable providing the pins meet the specification given in section 11.3 above
3. 10mm x 2mm Ceramic fibre tape must be installed between the bead and face of the glass on both glass faces. The tape must finish flush with the top of the bead
4. The glass must be fitted with maximum 8mm edge cover and allowing for 13mm expansion on all edges
5. An 8mm thick hardwood aperture liner is to be fitted using PVA or PU adhesive
6. Aperture shape is not restricted, providing the glazing system and beads are compatible with that shape
7. Timber for glazing beads must be hardwood, straight grained, joinery quality, free from knots, splits and checks
8. Glazed openings must not be less than 100mm from any edge, with a minimum dimension of 80mm between apertures
9. Multiple apertures are permitted, subject to point 8 above.

## 11.5 Pilkington Pyroclear Glazing System

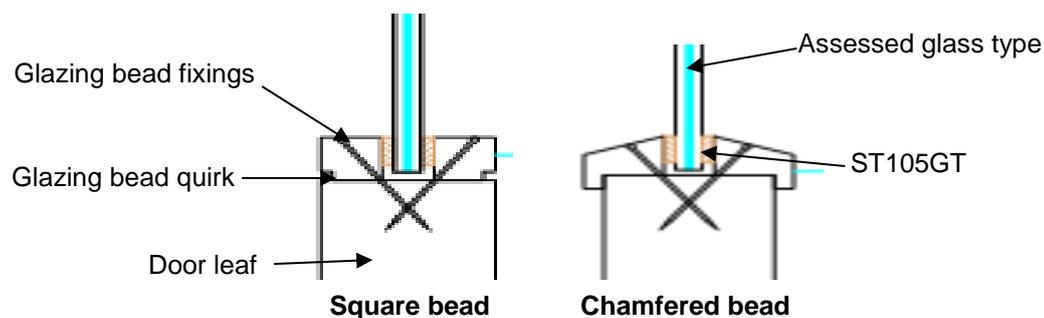
The following system must be used with the Pilkington Pyroclear glass type listed in section 11.2.

1. Hardwood (minimum density 640kg/m<sup>3</sup>) glazing beads 25mm high x 22mm deep with a 22° chamfer and a 5mm x 5mm bolection return
2. Beads must be retained in position with 50mm long steel pins or 50mm long No. 6 - 8 steel screws, inserted at 45° to the vertical, at no more than 50mm from each corner and at 150mm maximum centres. Pneumatically fired pins are acceptable providing the pins meet the specification given in section 11.3 above
3. 15mm x 5mm Fibrefrax ceramic tape must be installed between the bead and face of the glass on both glass faces. The tape must finish flush with the top of the bead
4. 10mm x 2mm Dufaylite Interdens must be fitted lining the glazing aperture
5. The glass must be fitted with maximum 10mm edge cover and allowing for 10mm expansion on all edges
6. Aperture shape is not restricted, providing the glazing system and beads are compatible with that shape
7. Timber for glazing beads must be hardwood, straight grained, joinery quality, free from knots, splits and check
8. Glazed openings must not be less than 100mm from any edge, with a minimum dimension of 80mm between apertures
9. Multiple apertures are permitted, subject to point 8 above.

## 11.6 STS Glazing System

The following specification must be followed when using the STS glazing system tested in PF15034.

The STS glazing system referenced ST105GT is illustrated below.



1. It is permitted to use square or chamfered glazing beads providing the beads are constructed in accordance with point 2 or 3 below
2. Square glazing beads must be constructed from hardwood (minimum density 640kg/m<sup>3</sup>) and must be a minimum of 15mm high by a depth to suit the glass thickness, including a 3mm x 3mm quirk
3. Chamfered glazing beads must be constructed from hardwood (minimum density 640kg/m<sup>3</sup>) and must be a minimum of 20mm high by a depth to suit the glass thickness, including a 5mm x 5mm bolection return and a 19° chamfer
4. Glazing beads must be retained in position with 38mm long steel pins or 40mm long No.6 - 8 steel screws, inserted at 35° to the vertical, at no more than 50mm from each corner and at 150mm maximum centres. Pneumatically fired pins are acceptable providing the pins meet the specification given in section 11.3 above

5. ST105GT may be supplied as 10mm x 5mm or 9mm x 3mm strips which must be installed between the bead and the glass on both faces, the two seal sizes may be freely interchanged, subject to restrictions in the table below

ST105GT seal dimensions (mm)	Permitted Glass types (see section 11.2)	Maximum Permitted Area (m <sup>2</sup> )
9 x 3	1 – 19	0.7
10 x 5	1 - 19	0.7

6. All glass types must be fitted fully in accordance with the manufacturers' tested details/installation requirements, particularly with respect to edge cover and expansion clearance
7. Aperture shape is not restricted, providing the glazing system and beads are compatible with that shape
8. Timber for glazing beads must be straight grained, joinery quality hardwood, free from knots, splits and checks
9. Glazed openings must not be less than 100mm from any edge, with a minimum dimension of 80mm between apertures
10. Multiple apertures are permitted, subject to point 9 above.

### 11.7 Improved Security Bead

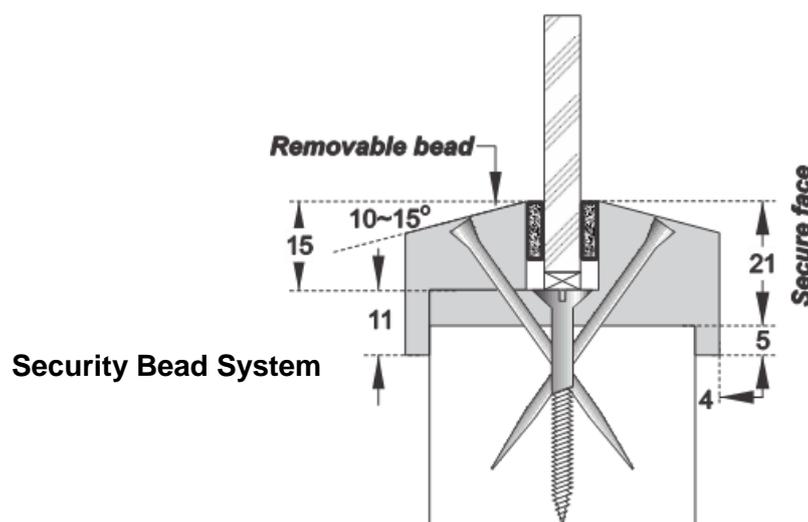
A combined bead and aperture lining can be used to deny access to fixings from one side of the door leaf to improve security.

All glazing details are to meet the specification given in sections 11.1, 11.2, 11.3, 11.4 and 11.5 unless otherwise stated below.

The aperture in the door must be lined using minimum 26mm thickness combined bead and lining in hardwood of minimum 640kg/m<sup>3</sup> density.

The combined bead and lining is bonded to the aperture in the door using the adhesive types approved for lippings (see section 15) and reinforced using 6 – 8 size steel 50mm long screw fixings located centre thickness of the door at 200mm centres.

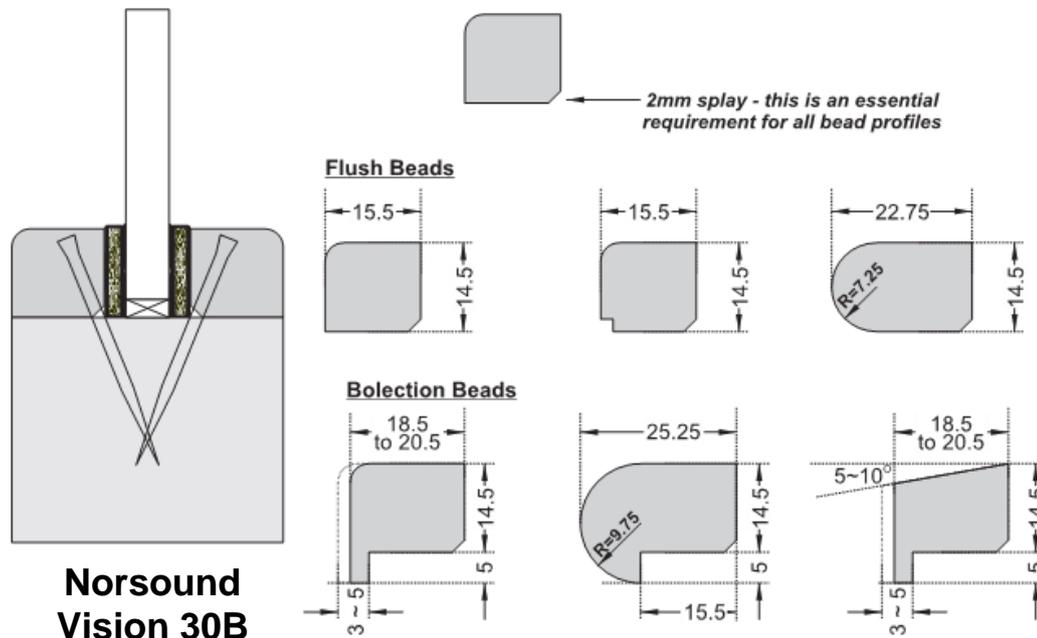
The beads must be retained in position with 50mm long steel pins or 50mm long No. 6 - 8 screws, inserted at 35 - 40° to the vertical. Fixings must be at 150mm maximum centres and no more than 50mm from each corner. Pneumatically fired pins are acceptable providing the pins meet the specification given in section 11.3 above. The bead profile must be appropriate for the glazing system selected.



## 11.8 Norsound Ltd. – Norsound Vision 30B

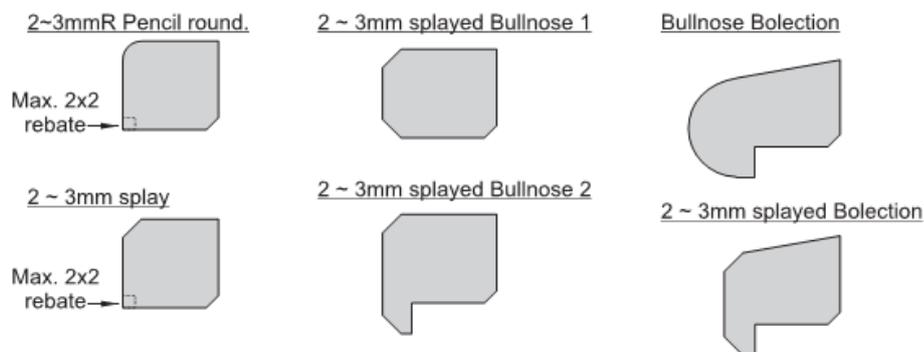
The Norsound Ltd. glazing system tested in IF12011 has the following scope of application in addition to that described in sections 11.1 - 11.3 and 11.7.

The Norsound Vision 30B is illustrated below:



### Norsound Vision 30B Bead Profiles

**NOTE:** When used with flush beads the maximum approved glass thickness for use in 44mm thickness doors is 12mm.



1. Bead height must be nominally 14.5mm
2. The intumescent seal component of Norsound Vision 30B is 15mm high and is required to project 0.5mm above the sightline of the bead
3. Bolection returns should be a minimum of 5mm high, and a minimum of 3mm thick (projecting from the leaf face)
4. Glazing beads must be retained in position with, minimum, 40mm long steel pins or, minimum, 40mm long No. 6-8 screws, inserted at 35-40° to the vertical at no more than 40mm from each corner and at 150mm maximum centres
5. Pneumatically fired pins are acceptable providing the pins meet the specification given in section 11.3.

The bead material must meet the following specification and may be used with glass types 1 - 4 and 9 - 19 listed in section 11.2.

<b>Material</b>	<b>Min. Density (kg/m<sup>3</sup>)</b>
Straight grained joinery quality softwood, free from knots, splits & checks	510
Straight grained joinery quality hardwood, free from knots, splits & checks	510
MDF	700

### 11.9 Streframe Glazing Beads

The Falcon Panel Products Ltd. Streframe glazing beads have the following scope of application based on the testing conducted in PF14029.

1. Streframe glazing beads must be a minimum of 37mm high by a depth to suit the glass thickness, including a 7mm x 13mm bolection return and a 25° chamfer
2. Streframe glazing beads must be retained in position with 60mm long steel pins, inserted at 45° to the vertical, at no more than 50mm from each corner and at 120mm maximum centres. Pneumatically fired pins are acceptable providing the pins meet the specification given in section 11.3 above
3. 25mm x 4mm Intumescent Seals Ltd. Therm-A-Bead is to be fitted between the bead and the glass on both faces
4. 54mm x 2mm Intumescent Seals Ltd. Therm-A-Line must be fitted lining the glazing aperture
5. Permitted glass types for use with the Streframe glazing beads are restricted to glass types 9 – 19 given in the table in section 11.2 above.
6. The maximum glazed aperture area when using Streframe glazing beads will be dictated by the maximum area permitted for the glass type in use
7. All glass types must be fitted fully in accordance with the manufacturers' tested details/installation requirements, particularly with respect to edge cover and expansion clearance
8. Aperture shape is not restricted, providing the glazing system and beads are compatible with that shape
9. Glazed openings must not be less than 100mm from any edge, with a minimum dimension of 80mm between apertures
10. Multiple apertures are permitted, subject to point 9 above.

### 11.10 Morland Quickfix Glazing Beads

The Morland Quickfix MDF glazing beads have the following scope of application based on the testing conducted in WF341550 and WF342584.

1. The maximum glazed aperture area permitted when using the Morland Quickfix glazing beads is 0.48m<sup>2</sup>
2. Permitted glass types for use with the Morland Quickfix MDF glazing beads are restricted to glass types 1 – 4 and 9 - 11 given in the table in section 11.2 above
3. Morland Quickfix glazing bead dimensions are held in confidence on file by Exova Warringtonfire
4. Morland Quickfix MDF glazing beads must be retained in position with 50mm long steel pins, inserted at 30° to the vertical, at maximum 150mm centres on the vertical beads and maximum 230mm centres on the horizontal beads. Pneumatically fired pins are acceptable providing the pins meet the specification given in section 11.3 above
5. When using glass type 9 from the table in section 11.2 above, a 6mm deep bead of Lorient Polyproducts Ltd. 4 hour fire-rated intumescent mastic must be applied around the perimeter of the glass
6. All glass types must be fitted fully in accordance with the manufacturers' tested details/installation requirements, particularly with respect to edge cover and expansion clearance
7. Aperture shape is not restricted, providing the glazing system and beads are compatible with that shape
8. Glazed openings must not be less than 100mm from any edge, with a minimum dimension of 80mm between apertures.
9. Multiple apertures are permitted, subject to point 8 above.

### 11.11 Vistamatic VS2 Secure Vision Panel

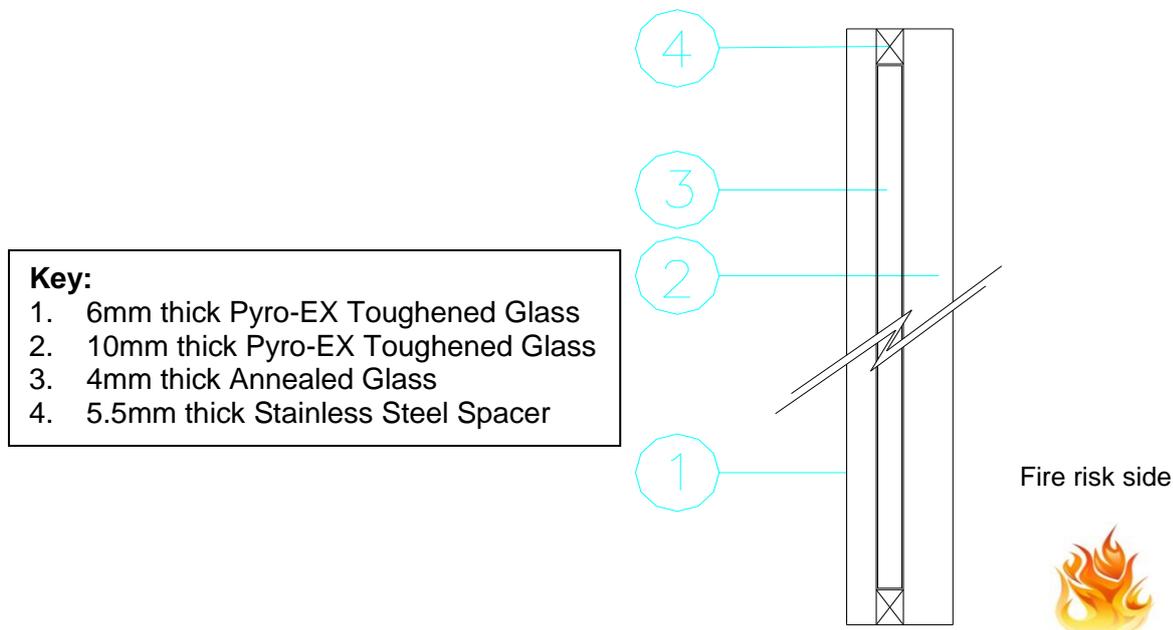
The following specification must be followed when using the Vistamatic VS2 secure vision panel tested in Chilt/RF12065 Revision B.

The Vistamatic VS2 vision panel comprises a double glazed unit with an additional, movable centre layer of obscure glass. The 10mm thick toughened glass must be oriented to the fire risk side of the doorset.

The unit must be fitted in accordance with Vistamatics' tested details/installation requirements, particularly with respect to edge cover and expansion allowance.

Aperture shape must be rectilinear. Glazed openings must not be less than 100mm from any edge, with a minimum of 80mm between apertures. Multiple apertures are permitted subject to the spacing requirements listed above, with individual panes not exceeding 0.6m<sup>2</sup>.

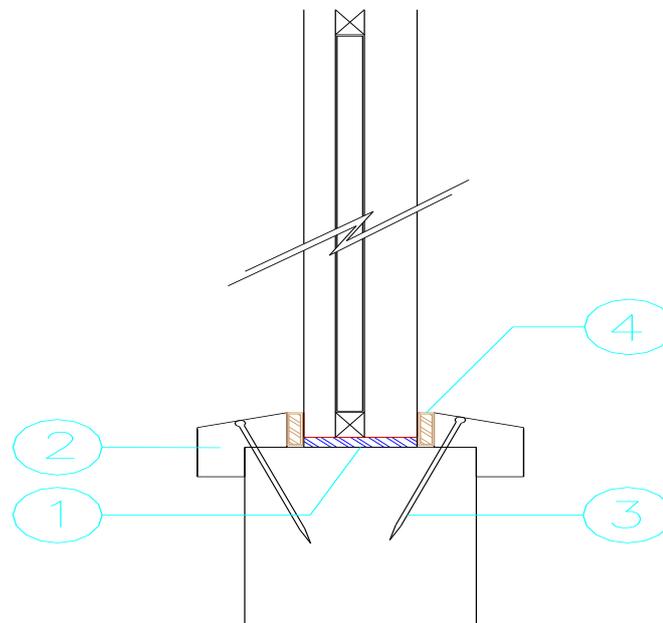
The drawing below shows the essential elements of the double glazed unit.



The vision panel is retained within the door leaf with either timber or steel beads, which must meet the specifications in the relevant section below.

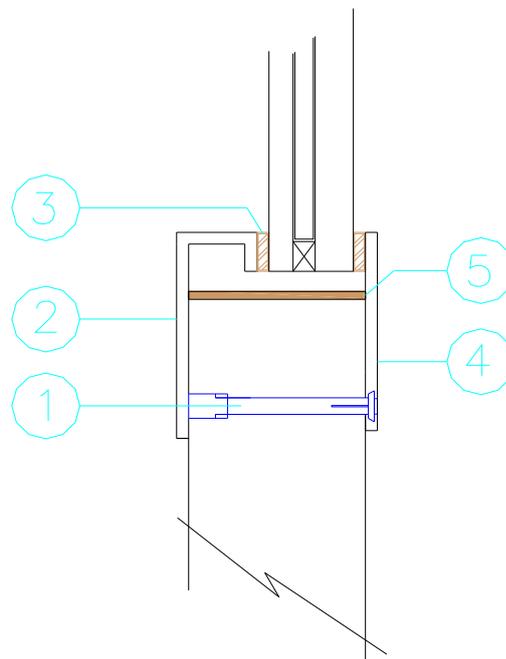
### 11.11.1 Timber Beads

Element	Specification
Timber bead material <sup>2</sup>	Hardwood of minimum density 640kg/m <sup>3</sup>
Glazing system <sup>4</sup>	10mm high x 3mm thick Pyroglaze 30 – Mann McGowan Ltd.
Aperture liner <sup>1</sup>	3mm thick Firewizard acrylic intumescent mastic – Norsound Ltd.
Around centre glass actuator spindle	5mm thick graphite sheet; Ref: 2.5-390 x 10/SA – Norsound Ltd.
Bead fixings <sup>3</sup>	40mm long No. 6 - 8 steel screws or 40mm long steel pins located at minimum 150mm centres and 50mm from each corner. Fixings must be inserted at 35 - 40° to the vertical and located to 'cradle' the vision panel.
Minimum required bead size	20mm (h) x 17mm (w) including a 9mm x 9mm bolection return and a 15° chamfer.
Maximum glazed area (m <sup>2</sup> )	0.6



### 11.11.2 Steel Beads

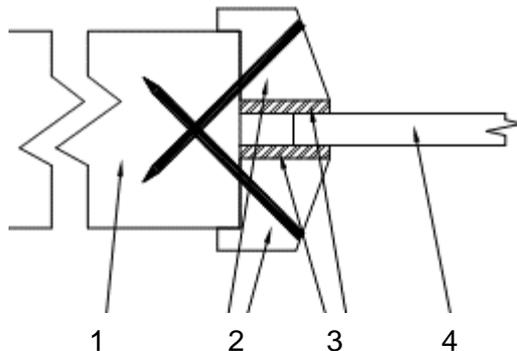
Element		Specification
Bead material		2mm thick stainless steel
Glazing system <sup>3</sup>		10mm high x 2.5mm thick Raw Graphite; Ref: 2.5-390 x 10/SA – Norsound Ltd.
Aperture liner <sup>5</sup>		Intumescent Liner; Ref: 1.8-408 x 53/SA – Norsound Ltd.
Around centre glass actuator spindle		2No. 5mm thick (overall) graphite sheet; Ref: 2.5-390 x 10/SA – Norsound Ltd.
Bead fixings <sup>1</sup>		40mm long M5 machine steel screws fixed from the exposed face to threaded studs welded to the unexposed face. Beads located at minimum 170mm centres and 20mm from each corner.
Bead profile	Exposed face <sup>4</sup>	50mm high x 2mm thick
	Unexposed face <sup>2</sup>	50mm high x 20 mm deep x 2mm thick
Maximum glazed area (m <sup>2</sup> )		0.6



### 11.12 Sealmaster Intumescent Foam Glazing Tape

The following specification must be followed when using the Sealmaster Intumescent Foam Glazing Tape glazing system based on the testing cited in Appendix A (see report WF386959 Rev A).

The Sealmaster Intumescent Foam Glazing Tape system is illustrated below.



**Key:**

1. Door Leaf
2. Glazing Beads
3. Sealmaster Intumescent Foam Glazing Tape
4. Assessed Glass Type

1. It is permitted to use square or chamfered glazing beads providing the beads are constructed in accordance with points 2 or 3 below
2. Square glazing beads must be constructed from hardwood (minimum density 640kg/m<sup>3</sup>) and must be a minimum of 20mm high by a depth to suit the glass thickness, including a 3mm x 3mm quirk
3. Chamfered glazing beads may be constructed from mdf, softwood or hardwood, subject to the restrictions in point 6, and must be a minimum of 25mm high by a depth to suit the glass thickness, including a 5mm x 5mm bolection return and a 15 - 20° chamfer
4. Glazing beads must be retained in position with 38mm long steel pins or 40mm long No.6 - 8 steel screws, inserted at 45° to the vertical, at no more than 50mm from each corner and at 150mm maximum centres. Pneumatically fired pins are acceptable providing the pins meet the specification given in section 11.3 above
5. Sealmaster Intumescent Foam Glazing Tape is 20mm x 5mm (uncompressed) and must be used between the bead and the glass on both faces
6. Permitted glass types for use when utilising mdf or softwood glazing beads are restricted to glass types 1 – 11 given in the table in section 11.2 above
7. All glass types must be fitted fully in accordance with the manufacturers' tested details/installation requirements, particularly with respect to edge cover and expansion clearance
8. Aperture shape is not restricted, providing the glazing system and beads are compatible with that shape
9. Timber for glazing beads must be straight grained, joinery quality timber, free from knots, splits and checks
10. Glazed openings must not be less than 100mm from any edge, with a minimum dimension of 80mm between apertures
11. Multiple apertures are permitted, subject to point 10 above.

## 12 Fanlights & Side Screens

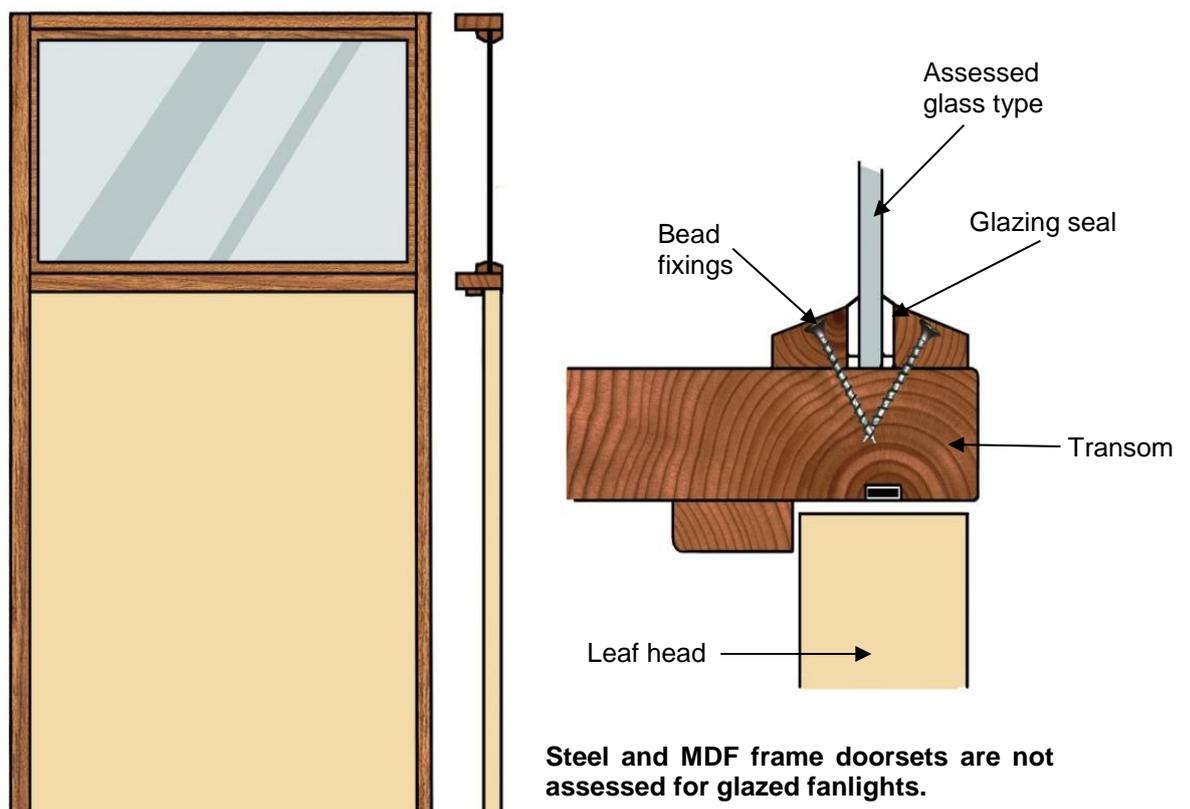
### 12.1 Glazed Fanlights

Timber frame doorsets including a transom may include a glazed fanlight. The timber frame and glazing beads must be hardwood with a minimum density of 640kg/m<sup>3</sup>, whilst the frame section for the transom must be a minimum of 70mm x 44mm. Timber door frame and transom construction must comply with the specification contained in section 13 (frames).

The maximum assessed fanlight dimensions are detailed in the table below, subject to the following restriction:

- The glazing system and glass must be able to demonstrate adequate performance when tested as a window or screen in accordance with BS 476: Part 22: 1987, or BS EN 1634-1, at the pane dimensions to be installed.

Configuration	Height (mm)	Width (mm)
Single & double doorsets	≤600	Overall door width



**Note:** The above drawing is indicative only and the actual construction must be as specified within this document.

The use of a fanlight frame with a modular construction (i.e. fanlight frame and doorframe being manufactured as two separate items) is acceptable provided the components are fixed together during installation by screwing and gluing the bottom element of the overpanel frame to the door leaf head (forming a double transom). Screw fixings must be a maximum 50mm from the corners and maximum 250mm centres combined with gluing using a UF or PU adhesive. The overall frame section and material must match that given in this assessment for each glass type and glazing specification. Joints must be tight with no gaps. It is permitted to include maximum 3mm (w) x 3mm (d) quirks/pencil rounds at the junction of each timber section.

## 12.2 Fanlights & Side Screens - Norsound Vision Glazing Systems

### 12.2.1 General

Falcon Panel Products Ltd. Strebord® 44 Panelled / Strebord® Superpan Panelled doorsets installed within timber frames may include glazed fanlights and/or side screens only installed utilising the Norsound Ltd Vision glazing system described in the following section.

The glazing system and beads must meet the specification shown in section 12.2.4.

The door frame and screen framing construction must comply with the specification shown in section 12.2.7.

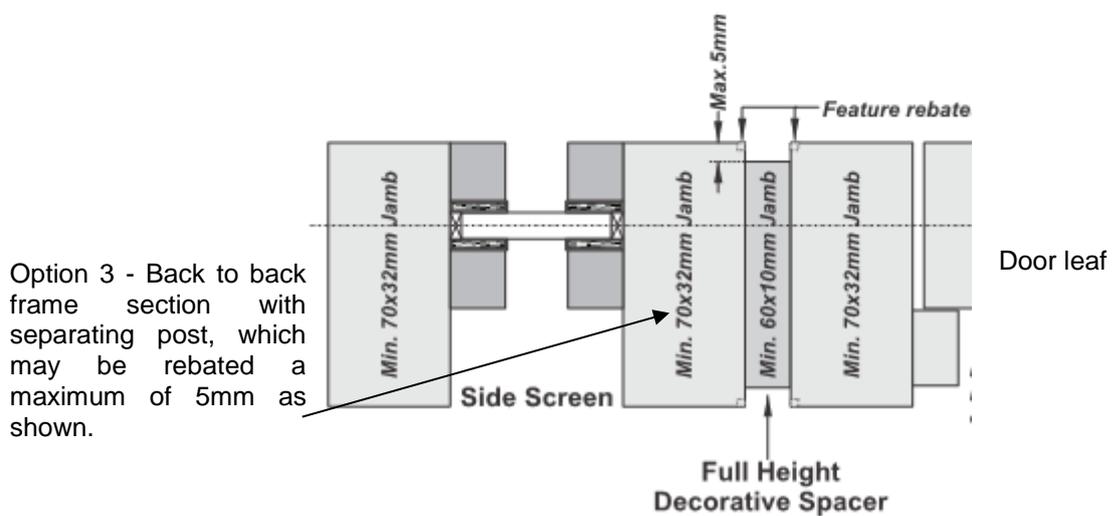
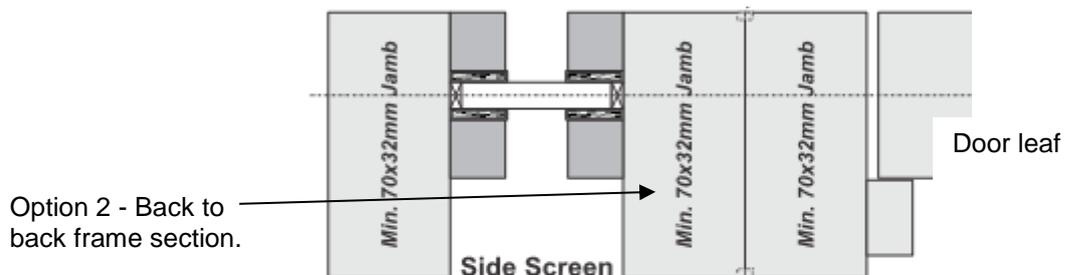
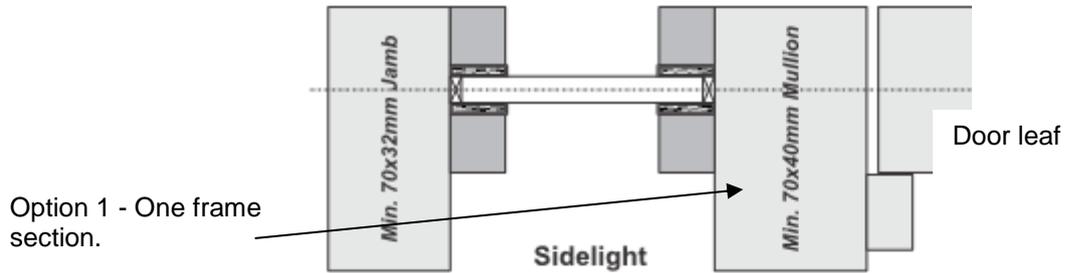
The maximum assessed fanlight and side screen dimensions are detailed in the table below, subject to the following restriction:

- The glass must be able to demonstrate adequate performance when tested as a window or screen in accordance with BS 476: Part 22: 1987 or BS EN 1634-1, at the pane dimensions to be installed.

Screen Element	Configuration	Height (mm)	Width (mm)
Fanlight	Single & double doorsets	≤600	Overall door width
Side screen	Single & double doorsets	Overall door height	≤600

### 12.2.2 Common Frame Sections

The following drawings depict possible constructions of common frame sections for screens and door frame jambs:



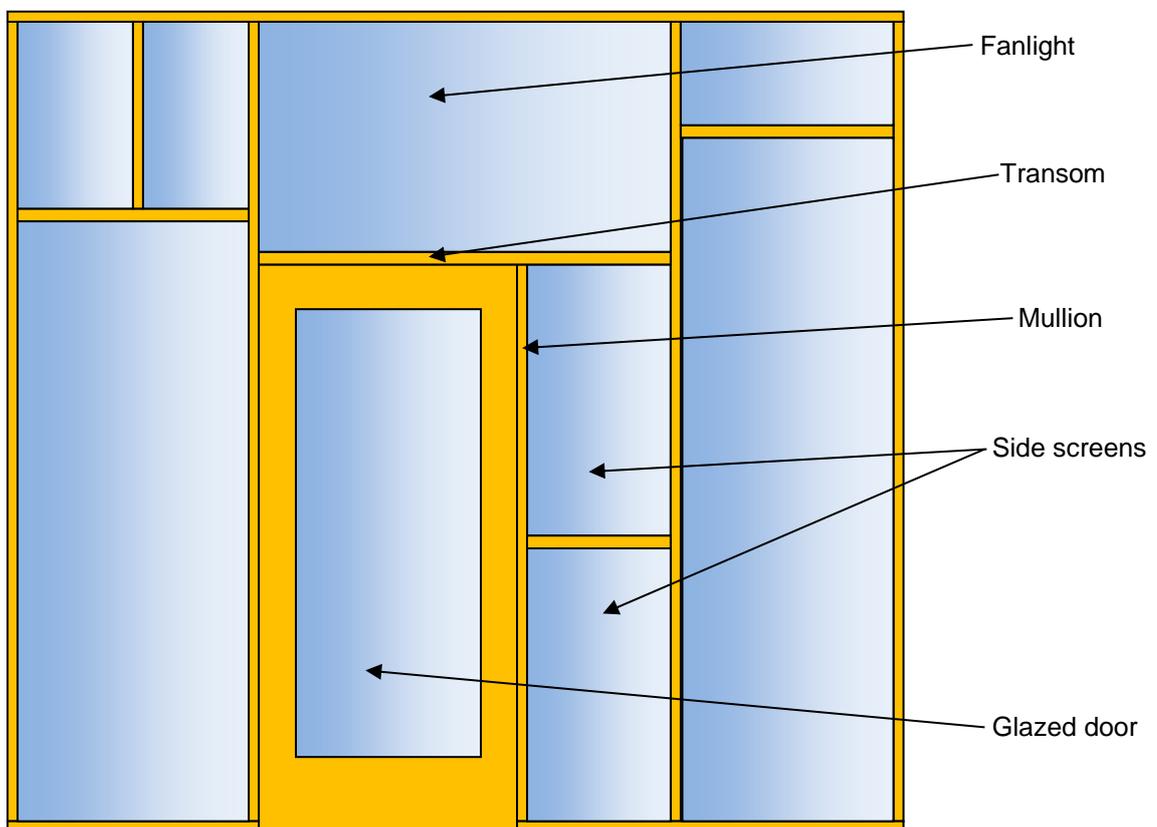
When using separate sections of timber, as shown above (options 2 & 3), each section must be suitably fixed to one-another using appropriate steel screw fixings and glued using Urea Formaldehyde or polyurethane. Screws must be fixed at 600mm centres and locate to approx 2/3 depth of the adjacent timber section. The overall frame section and material must match that given in this assessment for each glass type and glazing specification. Joints must be tight with no gaps.

It is permitted to include maximum 3mm (w) x 3mm (d) quirks/pencil rounds at the junction of each timber section for options 2 & 3.

Drawings are representative of each type of common frame section makeup; actual construction in terms of intumescent seal location and material, etc. must be as the text within this document specifies.

### 12.2.3 Screen Elevation

The following drawing depicts a possible door and glazed screen configuration. The diagram is for information only. All construction details to remain as specified herein.



### 12.2.4 Glazing Beads & Installation

Glazing beads and intumescent materials must be installed meeting the following sections.

System Name		Norsound Vision 30B
Typical Installation		
Sizes	Bead Height	Nominally 14.5
	Intumescent Seal(s)	15 high x 3 thick
Aperture Liner		Not required

### 12.2.5 Norsound Vision 30B Applications

The following bead designs are assessed as acceptable:

#### Typical Flush Bead Types:

NOTE 1: \* = 2mm Splay applies to all bead profile types.



1. Bead height must be nominally 14.5mm
2. The intumescent seal component of Norsound Vision 30B is 15mm high and is required to project 0.5mm above the sightline of the bead
3. Glazing beads must be retained in position with, minimum, 40mm long steel pins or, minimum, 40mm long No. 6 - 8 screws, inserted at 35 - 40° to the vertical at no more than 40mm from each corner and at 150mm maximum centres
4. Pneumatically fired pins are acceptable providing the pins meet the specification given in section 11.3 above.

### 12.2.6 Glazing Bead Material

All timber for glazing beads must be straight grained, joinery quality (MDF, softwood or hardwood as specified in the table below), free from knots, splits and checks.

Bead Profile	Material	Min. Density (kg/m <sup>3</sup> )
All in section 12.2.5	Softwood	510
	Hardwood	
	MDF	700

### 12.2.7 Timber Screen Framing

Timber used for constructing framing elements comprising screen assemblies as illustrated in section 12.2 must meet the following specification.

Door frame jambs and transoms must meet the requirements stipulated within the supporting documentation for the relevant door leaf as specified.

Material	Minimum Section Size <sup>2</sup> (mm)	Min. Density (kg/m <sup>3</sup> )
Softwood	70 x 32	510
Hardwood		

1. These timber sections may be used for the perimeter framing of the screen and the transoms separating individual panes of glass within the fanlights and side screens
2. Mullions must be minimum 40mm thick
3. The fanlights and side screens may comprise multiple panes of glass providing the total doorset and screen assembly does not exceed 2950mm high and the transom/mullion restrictions above are complied with
4. Gaps between glass and framing to permit expansion should be set according to the glass manufacturer's information, using non-combustible or hardwood setting blocks at the bottom edge.

## 13 Door Frames

### 13.1 Timber Based Door Frame Construction

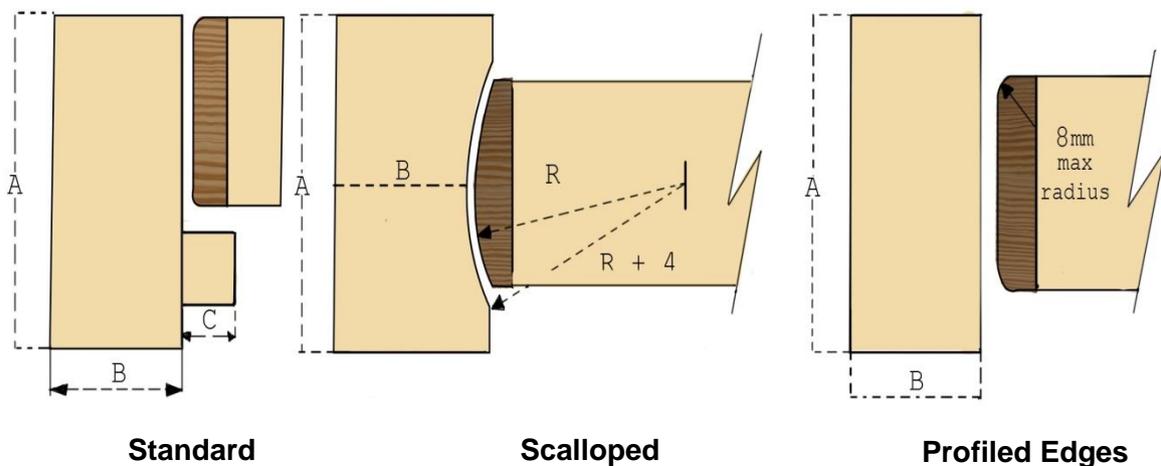
Timber based door frames for the door leaf designs referred to in sections 2.1 - 2.3 of this assessment must be constructed to meet the following specification.

Material	Section Size <sup>1</sup> (mm)	Min. Density (kg/m <sup>3</sup> )
Softwood or hardwood	70 x 25 (excluding the stop)	450
Streframe E <sup>2</sup>	70 x 32 (excluding the stop)	510
MDF	70 x 25 (excluding the stop)	700

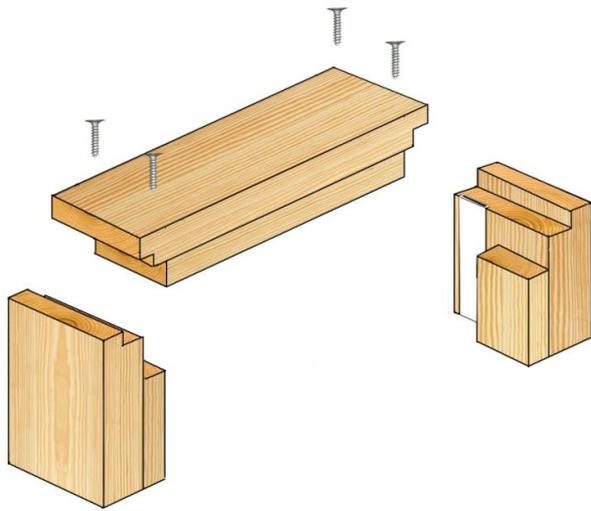
#### Notes:

1. If the doorset features a transomed overpanel, the door frame must be softwood or hardwood with a minimum section of 70mm x 30mm
2. See test report PF14029 & WF384630
3. All door frame timber must be straight grained, joinery quality, free from knots, splits and checks
4. A 12mm deep planted stop is adequate for single acting frames whilst double acting frames may be scalloped or square (see diagram below)
5. Frame joints may be mortice and tenoned, mitred, half lapped or butted and with no gaps (see section 13.2). All jointing methods require mechanical fixing with the appropriate size ring shank nails or screws
6. Door frames utilising engineered timber sections may be used provided the specified door frame can demonstrate suitable test evidence to BS 476 part 22: 1987 or BS EN 1634-1 when using comparable, timber-based door leaves, and is assessed as suitable for use with Falcon Strebord 44 door blanks. BS EN 942: 2007 provides guidance on the specification of engineered timber
7. The following diagram depicts the assessed frame profiles and dimensions:

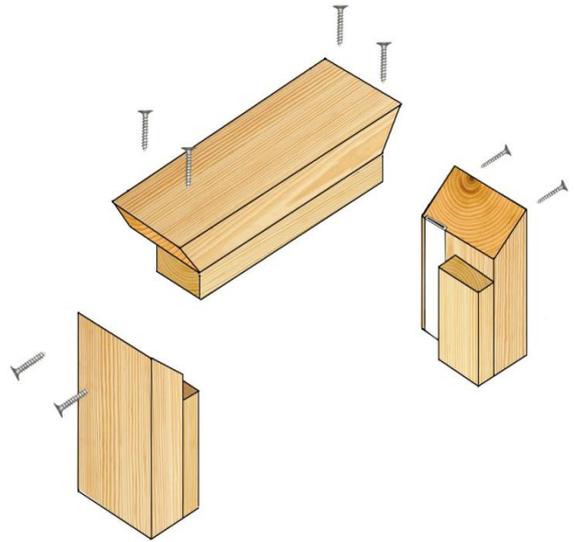
A = Min. 70mm  
B = Min. 25mm (see table above)  
C = Min. 12mm  
R = Radius from floor spring  
8mm radius to create maximum 2mm edge profiling



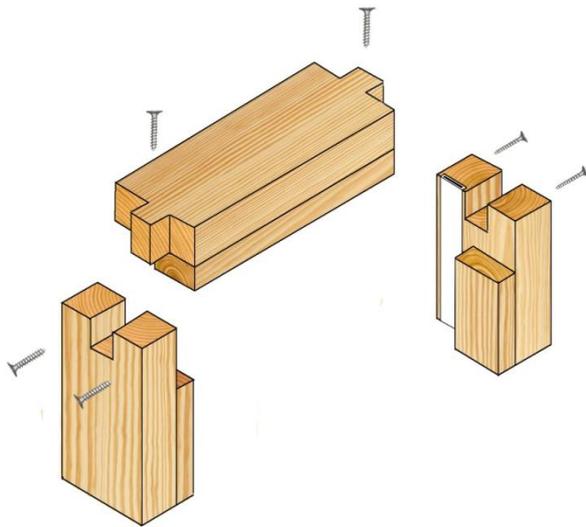
### 13.2 Door Frame Joints



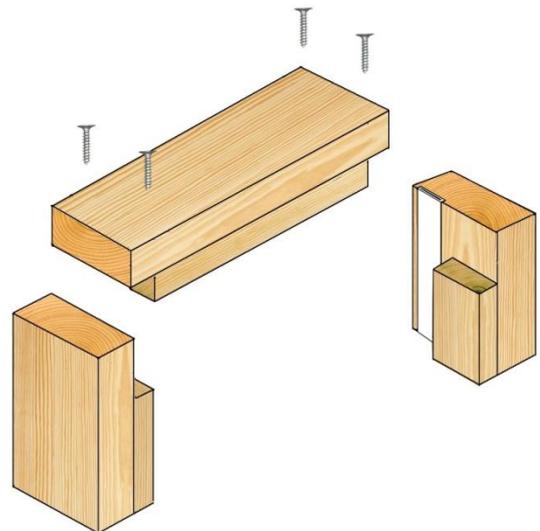
Half Lapped Joint



Mitre Joint



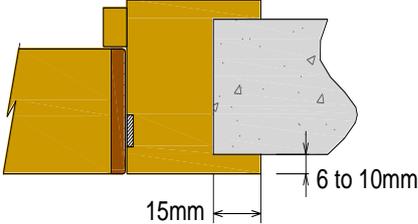
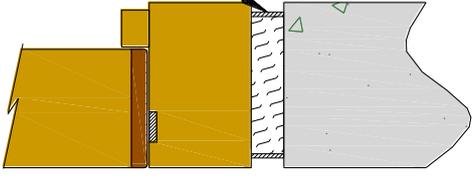
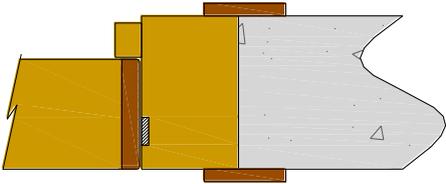
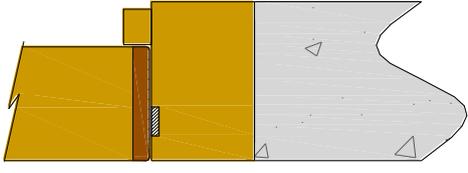
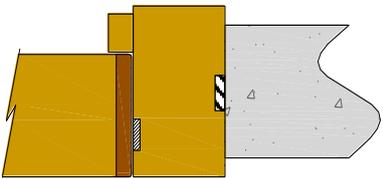
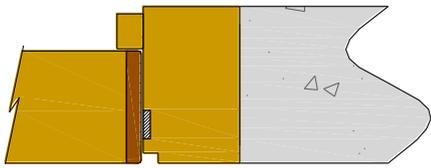
Mortice & Tenon Joint



Butt Joint

### 13.3 Door Frame Installation

The following diagrams indicate acceptable and unacceptable frame installations:

<b>Permitted Installations</b>	
 <p>6-10mm is the maximum a frame is permitted to be proud of the structural surround when combined with a 15mm bolection return. Projecting frames outside these dimensions will require specific test evidence or assessment.</p>	<p>Max 10 x 10mm shadow gap with 2mm intumescent mastic capping or 10 x 4mm PVC encased intumescent seal</p>  <p>Shadow gaps are permitted as shown in the above diagram providing the frame to structural surround is infilled with timber of the same density as the frame or a non-combustible material such as plasterboard. Other shadow gap dimensions will require specific test evidence or assessment.</p>
 <p>Architraves overlapping the frame to structural surround junction are always permitted where required but may be mandatory depending on the size of frame to surround junction gap and the fire stopping used. See section on Sealing to the Structural Surround.</p>	 <p>Depending on the size of the frame to surround junction gap and the fire stopping methods used, it may be permitted to install doorsets without architraves. See section on Sealing to the Structural Surround.</p>
<b>Permitted Installation</b>	<b>Not Permitted Installation</b>
 <p>Projecting frames without bolection returns are permitted with a maximum projection of 10mm, provided the frame is a minimum of 40mm thick and a 10 x 4mm intumescent seal (of one of the edge seal types in section 14) is fitted in the rear of the frame. The use of Streframe E is not permitted.</p>	 <p>Quirks between the leaf and frame are not permitted without specific test evidence or assessment due to the potential for increased charring of the leaf to frame gap.</p>

The diagrams above are representative; actual installation must be as the text within this document specifies. See section 22 for sealing to structural opening

## 14 Intumescent Materials

The intumescent materials tested and assessed for these doorset designs are as follows.

Application	Location	Product/Manufacturer
Edge seals	Fitted in the frame jambs or leaf edges	<ol style="list-style-type: none"> <li>1. PVC encapsulated Palusol 100 – Mann McGowan Fabrications Ltd. or Lorient Polyproducts Ltd.</li> <li>2. Therm-A-Seal – Intumescent Seals Ltd.</li> <li>3. Pyroplex - Pyroplex Ltd.</li> <li>4. Type 617 - Lorient Polyproducts Ltd.</li> <li>5. STS Fire – Sealed Tight Solutions Ltd.</li> </ol>
	Fitted in the frame reveal (not approved as a seal for overpanel edges)	<ol style="list-style-type: none"> <li>1. Norfast – Norsound Ltd.</li> </ol>
Hinges	Under all hinge blades for doorsets greater than 2670mm high	<ol style="list-style-type: none"> <li>1. 1mm Interdens – Dufaylite Developments Ltd.</li> <li>2. 1mm MAP paper – Lorient Polyproducts Ltd.</li> <li>3. 1mm Pyrostrip 300 – Mann McGowan Fabrications Ltd.</li> </ol>
Lock/latches	Under forend & keep for double doorsets only up to 1200mm from threshold	<ol style="list-style-type: none"> <li>4. 1mm Therm-A-Strip – Intumescent Seals Ltd.</li> <li>5. 1mm NOR910 – Norsound Ltd.</li> <li>6. 1mm STS Graphite – Sealed Tight Solutions Ltd.</li> </ol>
	Under forend, keep and lining all sides of mortice for locks/latches positioned between 1200mm and 1600mm from threshold	<ol style="list-style-type: none"> <li>1. 1mm STS Graphite – Sealed Tight Solutions Ltd.</li> </ol>
Top pivots & flush bolts	Lining all sides of the mortices	<ol style="list-style-type: none"> <li>2. 2mm Interdens – Dufaylite Developments Ltd.</li> <li>3. 2mm MAP paper – Lorient Polyproducts Ltd.</li> <li>4. 2mm Therm-A-Strip – Intumescent Seals Ltd.</li> <li>5. 2mm Therm-A-Flex – Intumescent Seals Ltd.</li> <li>6. 2mm NOR920 – Norsound Ltd.</li> <li>7. 1mm STS Graphite – Sealed Tight Solutions Ltd.</li> </ol>
Concealed Closer	See section 18.3.1 and 8.3.2 for full specification required when installing concealed closers	

## 15 Lippings

### 15.1 Timber Lippings

Falcon Panel Products Ltd. Strebord® 44 Panelled / Strebord® Superpan Panelled doors must be lipped in accordance with the following specification.

Material	Size (mm)	Min. Density (kg/m <sup>3</sup> )
Timber must be straight grained, joinery quality hardwood, free from knots, splits and checks	<ol style="list-style-type: none"> <li>1. Flat = 6 – 20 thick with a maximum of 2mm profiling permitted at corners of lipping (see section 13.1).</li> <li>2. Rounded = 8 –19 thick with a radius matching the distance between leaf edge and floor pivot (see section 13.1).</li> <li>3. Rebated = Not permitted.</li> </ol>	530 (see note 3)

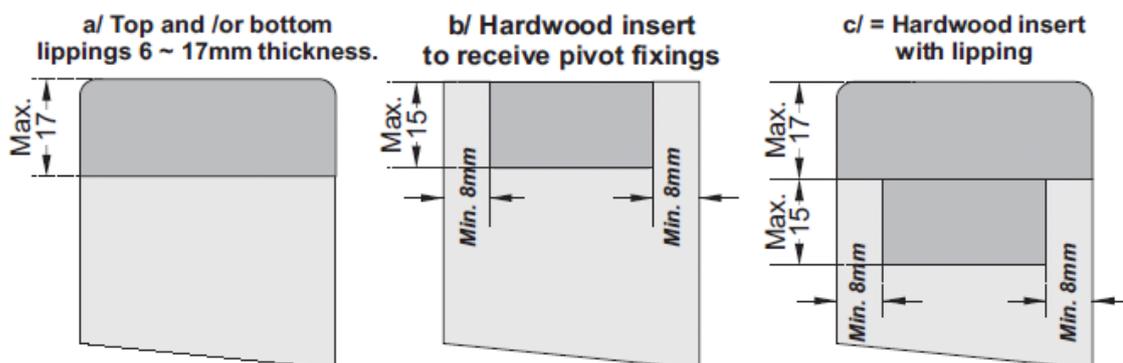
#### Notes:

1. Single and double doorsets only require lipping on the vertical edges but may be additionally lipped on the top and bottom edges if required
2. A 2.5° chamfer is permitted to the lipping at the leading edge of leaves providing the door gaps meet the requirements of section 19.
3. All rebated lippings and flat and rounded lippings thicker than 13mm must be constructed from hardwood timber of minimum 640kg/m<sup>3</sup> density
4. On-site adjustment of the lippings by a maximum of 3mm for fitting purposes is permitted, providing the minimum dimensions stated above are maintained

### 15.2 Hardwood Blocking for Pivots

The following leaf edge option is permitted for lipping the top and bottom of doors that are to receive pivot fixings and are to be used in severe duty locations.

The hardwood insert must be a size (length) suited to the particular item of hardware plus a maximum of 50mm (but not be full door width) and must be securely adhered to the door core. The hardwood insert should not be greater than 15mm in depth and when fitted should provide for a minimum margin of 8mm to either face of the leaf. The inserted blocks must be bonded on all contact faces using adhesives approved for the application of lippings (see section 16). The hardwood insert must meet the minimum density requirements as given in the table in section 15.1.



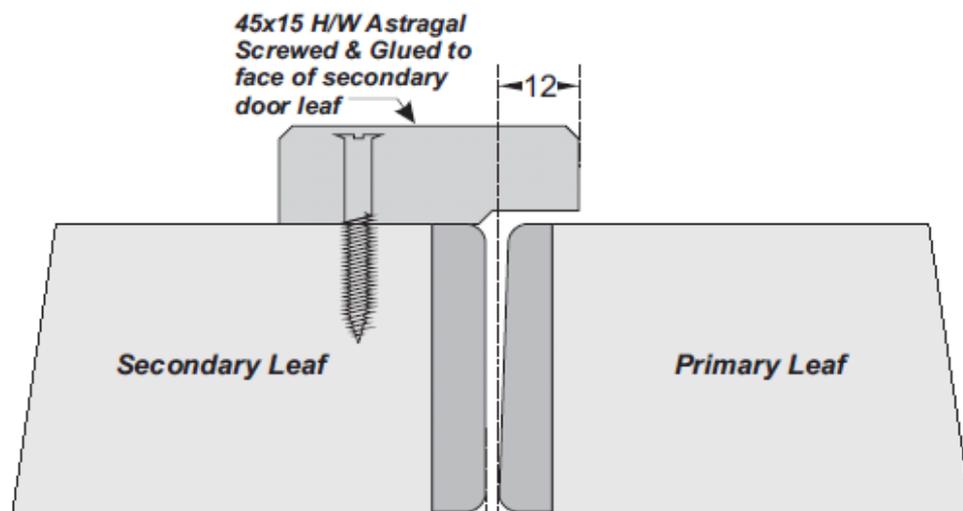
### 15.3 Meeting Stile Astragals

Generally fire doors should be able to open simultaneously. However, where additional performances are required (e.g. acoustic performances) it may be necessary to provide for sequential opening.

An astragal detail may be used where these conditions apply, without adverse influence on existing fire test/assessment data.

Astragals can be applied to both door leaves provided a suitable door selector is fitted and may be profiled for aesthetic effect providing they meet the minimum specification given below.

The hardwood for the astragal must be hardwood of the same minimum density being used for the lipping material. See following diagram:



### 16 Adhesives

The adhesives used in construction are as follows.

Element	Product
Core	Manufacturers specification
Lipping	Urea formaldehyde, polyurethane or PVA

## 17 Tested Hardware

The following hardware has been successfully incorporated in the tests on Falcon Panel Products Ltd. Strebord® 44 Panelled / Strebord® Superpan Panelled doorsets.

Element	Manufacturer & Product Reference
Hinges	Royde & Tucker H105 lift-off type hinges
Closers	Dorma TS68 Overhead Type Closer
Locks & latches	None
Furniture	None

## 18 Additional & Alternative Hardware

The following section details the permitted scope and constraints for fitting hardware to this door design.

### 18.1 CE Mark

The following items of hardware must also bear the CE Mark:

- Latches & Locks: Test Standard EN 12209
- Single Axis Hinges: Test Standard EN 1935
- Controlled Door Closing Devices: Test Standard EN 1154
- Door Co-ordinators: Test Standard EN 1158
- Electro-Mechanically Operated Locks: Test Standard EN 14846.

### 18.2 Certifire

Where alternative hardware to that tested is permitted in the following sections, Certifire approved hardware may be incorporated subject to the design, material and dimensional limitations identified within this assessment report and identified on the relevant Certifire certificate. This route cannot be used where only specific hardware options stated by the doorset manufacturer are permitted (i.e. where alternative hardware is not permitted).

### 18.3 Automatic Closing

Automatic closing devices must either be as tested or components of equal specification that have demonstrated contribution to the required performance of these types of 30 minute doorset designs, when tested to BS 476: Part 22: 1987 or BS EN 1634-1 or BS EN 1634-2.

**Note:** The top pivots to floorspring assemblies must be protected with 2mm thick intumescent gasket (see section 14) or alternatively the manufacturers tested intumescent pack.

### 18.3.1 Concealed Overhead Closers

Tests carried out on Falcon Panel Products Ltd. Strebord® 44 Panelled / Strebord® Superpan Panelled doorsets have successfully demonstrated the inclusion of overhead concealed closers. For panelled versions, it is acceptable to install concealed overhead closers subject to the following (the Rutland ITS11204 concealed overhead closer has been successfully tested for this application in Falcon Panel Products Ltd Strebord® 44 cores):

1. Top rail leaf framing detailed in section 7 must be increased by a minimum of 50mm
2. The closer installed must have test evidence to support use in similar doorset types and fitted with appropriate intumescent protection (as defined by test evidence and/or manufacturers' instructions)
3. Where closers have been tested in thicker door leaves, the door leaf thickness must also be increased accordingly (i.e. if test evidence for 30 minutes is a 54mm core, a 54mm core must be used).

### 18.3.2 Concealed Jamb Closers

Tests carried out on Falcon Panel Products Ltd Strebord® 44 Panelled / Strebord® Superpan Panelled doorsets have successfully demonstrated the inclusion of overhead concealed closers. For panelled versions, it is also acceptable to install concealed jamb closers subject to the following (the Astra 4000 concealed jamb closer has been successfully tested for this application in Falcon Panel Products Ltd Strebord® 44 cores):

1. Stile leaf framing detailed in section 7 must be increased by a minimum of 50mm beyond the depth of the closer. Alternatively, the closer must be fitted centrally to an intermediate rail of appropriate thickness (i.e. a minimum of 50mm of core material must be left between the closer and any other glazed aperture/panel recess)
2. The closer installed must have test evidence to support use in similar doorset types and fitted with appropriate intumescent protection (as defined by test evidence and/or manufacturers' instructions)
3. Where closers have been tested in thicker door leaves, the door leaf thickness must also be increased accordingly (e.g. if test evidence for 30 minutes is a 54mm core, a 54mm core must be used).

### 18.4 Latches & Locks

Latches and locks with the following specification are acceptable. A Maximum of 2 locks/latches can be fitted in any one leaf provided there is a minimum of 200mm between lock forend/keeps. As tested in WF386959, see appendix A.

Element	Specification
Maximum forend & strike plate dimensions	235mm high by 25mm wide by 4mm thick
Maximum body dimensions	165mm high by 100mm wide by 18mm thick
Intumescent protection	See section 14
Materials	All parts essential to the locking/latching action (including the latch bolt, forend and strike) to be steel, stainless steel or brass (melting point $\geq 800^{\circ}\text{C}$ )
Location	Between 750mm and 1200mm from the threshold
	Between 1200mm and 1600mm from the threshold with enhanced protection see section 14 as tested in WF386959

## 18.5 Hinges

Falcon Panel Products Ltd. Strebord® 44 Panelled / Strebord® Superpan Panelled doors must be hung on a minimum of 3 hinges. Leaves over 2400mm high must fit 4 hinges. Hinges with the following specification are acceptable.

Element		Specification	
Blade height		90 - 120mm	
Blade width (excluding knuckle)		30 - 36mm	
Blade thickness		2.5 - 4mm	
Fixings		Minimum of 4*No. 25mm long fully threaded screws per blade	
Materials		Steel, stainless steel or brass (melting point ≥800°C)	
Hinge positions	Leaf dimensions <2400mm	Top	120 -180mm from the head of the leaf to the top of the hinge
		2 <sup>nd</sup>	Minimum 200mm from top hinge to central between top and bottom hinge
		Bottom	150 - 250mm from the foot of the leaf to the bottom of the hinge
	Leaf dimensions >2400mm	Top	120 - 180mm from the head of the leaf to the top of the hinge
		2 <sup>nd</sup>	Minimum 200mm from top hinge to central between top and 3 <sup>rd</sup> hinge
		3 <sup>rd</sup>	Equispaced between 2 <sup>nd</sup> and bottom hinge
		Bottom	150 - 250mm from the foot of the leaf to the bottom of the hinge
	Intumescent protection		See section 14

\* Royde and Tucker H105 lift off hinges have been tested with 3 screw fixings, as manufactured, and may be utilized for this application with 3 fixings per blade.

It is also permitted to use screw fixings as tested and supplied with the hinges approved for the Strebord® design at 30 minutes fire resistance.

## 18.6 Tectus Concealed Hinges

It is permitted to fit the following Tectus concealed hinges to the Falcon Strebord® designs based on the results of fire test WF316349, subject to the notes below.

- TECTUS TE 340 3D FR
- TECTUS TE 640 3D A8 FR.

### Notes:

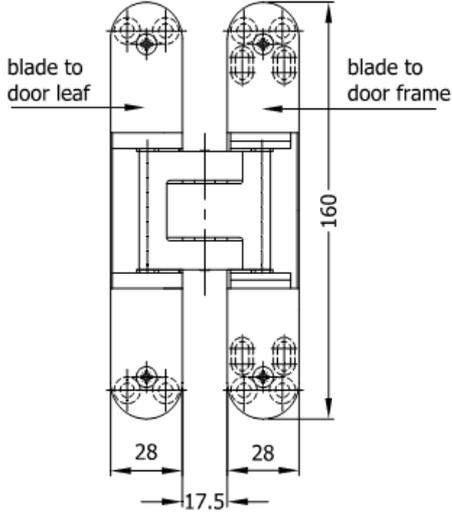
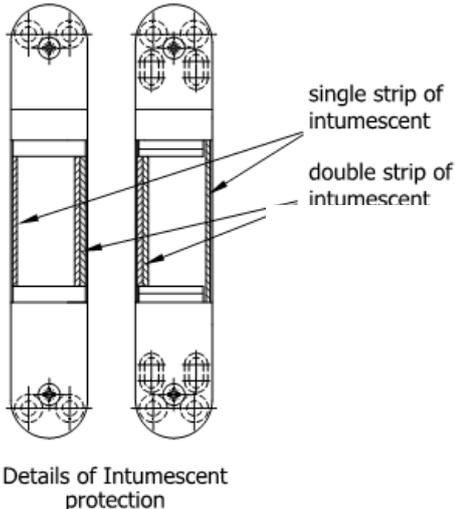
1. The frame profile for the hanging jamb of the doorframe (i.e. the jamb which will be rebated to accept the Tectus hinge) must be a minimum of 44mm thick, excluding the doorstop. Door frame materials and dimensions must otherwise remain as specified in section 13. Therefore the hanging jamb and the closing jamb may be of different dimensions
2. The material of the Tectus hinges must remain as tested; die cast zinc hinge body parts with aluminium knuckle components

3. The mortice must be as tight to the hinge body as is compatible with its operation
4. Fixings for the hinges must be stainless steel counter sunk head wood screws; 4No. per hinge blade and 40mm long by 5.2mm diameter.

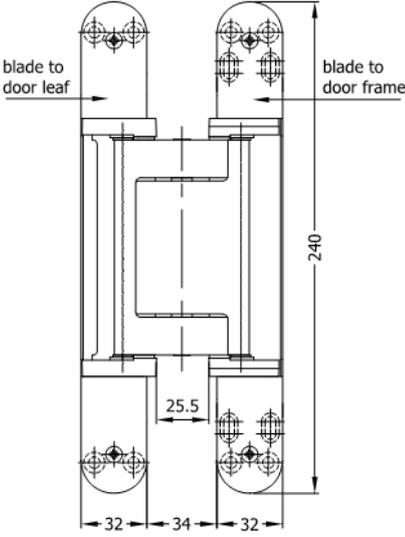
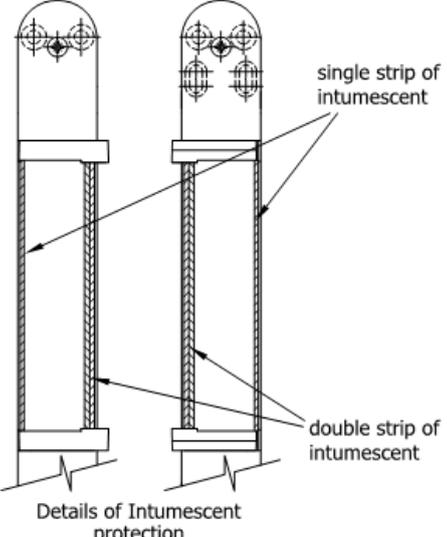
### 18.6.1 Intumescent and Installation Requirements

The following tables define the permitted intumescent protection and installation details required for use with the tested Tectus hinges.

#### TECTUS TE 340 3D FR

Element	Product & Manufacturer	Location (mm)
TECTUS TE 340 3D FR	ROKU strip M130 – Rolf Kuhn GmbH	Self-adhesive graphite strips fitted as illustrated below: Single strip—1 thick x 27 wide x 47 or 59 long. Double strip—Each 2 thick x 17 wide x 47 long.
		

## TECTUS TE 640 3D A8 FR

Element	Product & Manufacturer	Location (mm)
TECTUS TE 640 3D A8 FR	ROKU strip M130 – Rolf Kuhn GmbH	Self-adhesive graphite strips fitted as illustrated below: Single strip–1 thick x 36 wide x 115 long. Double strip–Each 2 thick x 22 wide x 115 long
		

### 18.7 Pull Handles

Handles may be fixed or bolted through the door leaf, providing they are steel or brass and the length is limited to 1200mm between the fixing points. If through-fixed, there must be no more than 1mm clearance between the hole and stud.

### 18.8 Push Plates/Kick Plates

Steel, stainless steel or brass plates are permitted up to a maximum of 20% of the door leaf area if mechanically fixed and a maximum of 30% if bonded with a contact or other thermally softening adhesive. Plates must not return around the door edges.

Kick plates (to a maximum size of 250mm high x 2mm thick) and finger plates (to a maximum size of 300mm high x 160mm wide x 2mm thick) may be recessed flush with the face and fitted on one or both sides of the leaf.

### 18.9 Door Selectors

These may be freely applied, provided that they are not invasive in the leaf edges or door frames and they do not interfere with the self-closing action of the door leaf. Products that are invasive will require fire resistance test/assessment evidence to support their use.

## 18.10 Flush Bolts

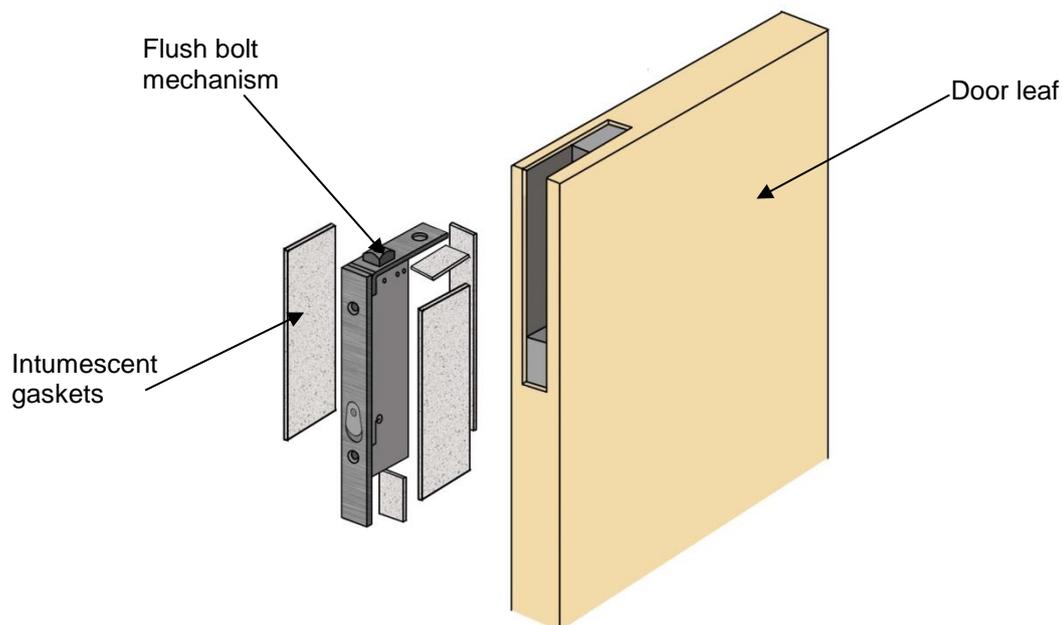
Flush bolts may be incorporated centrally into the top and bottom of one meeting edge, providing the following maximum dimensions are not exceeded and the components are fitted opposite the edge fitted with intumescent strips:

- Up to 205mm long x 20mm deep x 20mm wide\*

Flush bolts must be steel or brass (with a melting point  $\geq 800$  C) and the mortice must be as tight to the mechanism as is compatible with its operation. All edges of the mortice must be protected with intumescent gaskets as specified in section 14.

Alternatively, the hardware manufacturers tested gaskets may be used. See diagram below for example of intumescent protection to flush bolt:

Flush bolts of up to 900mm long x 20mm deep x 20mm wide may be installed if protected with 1mm STS graphite as successfully tested in PF15034 and specified in section 14.



## 18.11 Door Security Viewers

Door security viewers with brass or steel bodies of a diameter less than or equal to 15mm may be used provided that the through-hole is bored tight to the case of the viewer (maximum tolerance +1mm). Lenses must be glass and the item must be bedded into a tested intumescent material/mastic. Viewers may only be fitted through solid framing members.

## 18.12 Panic Hardware

Panic hardware may be fitted, provided that its installation does not require the removal of any timber from the leaf, stop or frame reveal and it in no way interferes with the self-closing action of the door leaf.

## 18.13 Air Transfer Grilles

### 18.13.1 General

Air transfer grilles may be fitted providing the product has suitable test evidence to BS 476: Part 22: 1987 or BS EN 1634-1, that demonstrates a minimum 30 minutes integrity performance when installed within a timber based doorset of comparable thickness. Margins to the leaf edges will remain as detailed for glazing and the position of the unit will be dictated by the pressure regime tested in the proving evidence (normally below mid-height). The area occupied by the air transfer grille must not exceed 0.2m<sup>2</sup> and must be deducted from the area of glazing, if both elements are fitted.

### 18.13.2 Pyroplex Air Transfer Grilles

The following Pyroplex air transfer grilles have been assessed as acceptable for use with the door leaf designs referred to in sections 2.1 - 2.3 of this assessment.

The grilles must be fitted 100mm from the edge of the door leaf and 80mm apart if more than one grille is to be fitted. The area occupied by the air transfer grille(s) must be deducted from the percentage of glazing, if both elements are fitted. The grilles may be fitted up to a maximum height of 2200mm from the threshold.

Grilles must not be fitted within a recessed panel (i.e. must only be fitted into areas of full thickness core) and must be surrounded on all sides by a minimum of 80mm of full thickness core.

Part No.	Dimensions (mm)	Air Flow (sq. cm)	Compatible Faceplates
ATG 1500	150 x 150	153	FP1500
ATG 1503	150 x 300	307	FP1503
ATG 1300	300 x 300	614	FP1300
ATG 2251	112 x 225	161	FP2251
ATG 2250	225 x 225	323	FP2250

The Pyroplex air transfer grilles must be installed in accordance with the manufacturer's installation details, which include a 6mm thick hardwood aperture liner and Pyroplex intumescent mastic applied around the perimeter of the grille. Full details can be obtained from Pyroplex Ltd.

### 18.14 Environmental Seals

Silicon based flame retardant acoustic, weather and dust seals (e.g. Lorient IS1212, IS1511, IS7025, IS7060, Norseal 710, Fire & Acoustic Seals FAS35 or Sealed Tight Solutions ST1009) may be fitted to this doorset design without compromising the performance, providing their fitting does not interfere with the activation of the intumescent seals or hinder the self-closing function of the leaves.

### 18.15 Threshold Seals

The following types of automatic threshold drop seals may be recessed in to the bottom rail of leaves to this design without compromising the performance.

Manufacturer	Product Reference
Norsound	NOR810, NOR810S & NOR810dB+
Lorient Polyproducts	IS8010s
Raven Products	RP8Si
Athmer	Schall-Ex Duo L-15
Sealed Tight Solutions	STS422 & STS422GT
Fire & Acoustic Seals	FAS45 & FAS810S

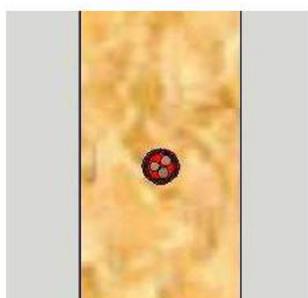
### 18.16 Cable-Ways

Test WF384630 demonstrated that the Strebord 44 door core can be machined for accepting cables to facilitate powered locks/strikes. Methods 1 & 2 (as defined in test report and below diagrams) are suitable for the Strebord® 44 Panelled / Strebord® Superpan Panelled door design.

#### 18.16.1 Cable-Way Method 1

1. Method 1 is only suitable where a horizontal intermediate rail minimum 80mm is situated and the cable routing must be positioned centrally within the rail
2. Cable routing must not be higher than 1500mm from bottom of the door leaf
3. Once the door is edged, a 10mm diameter hole is drilled across the entire width of the door and then lined with STS Cable-Pro\*
4. A PVC encased cable may then be fed through the channel
5. Interface between door leaf and frame (concealed loop) must be a tested product (e.g. Abloy EA280 or STS 633311) with intumescent protection as tested.

### WIREWAY METHOD 1



10mm diameter hole drilled through leaf horizontally

\*STS Cable Pro lining is not required for latched, single acting, single leaf doorsets not exceeding 900mm wide x 2100mm high.

### 18.16.2 Cable-Way Method 2

1. A channel not exceeding 10mm x 42mm machined to the core perimeter prior to the application of hardwood edges/lippings
2. A cable can then be fed within the channel, secured in place and any remaining void filled with a hardwood insert (minimum density 640 kg/m<sup>3</sup>) capped with 1mm intumescent material, glued in place using UF/PU adhesive
3. Cable routing must not run higher than 1500mm from bottom of the door leaf
4. Interface between door leaf and frame (concealed loop) must be a tested product (e.g. Abloy EA280 or STS 633311) with intumescent protection as tested.

## WIREWAY METHOD 2



### 18.17 Identification Plates

Plastic or metal fire safety signs may be glued or screwed to the face of the door leaves. The signage must comply with BS 5499-5: 2002 according to whether the door is:

1. To be kept closed when not in use (Fire Door Keep Shut)
2. To be kept locked shut when not in use (Fire Door Keep Locked Shut)
3. Held open by an automatic release mechanism or free swing device (Automatic Fire Door Keep Clear).

It is also permitted to fit aluminium (max. thickness 2mm) or PVC (max. thickness 3mm) identification plates, complying with HTM 58 – *Internal Doorsets, HTM Building Component Series, NHS Estates*. The signage must not exceed 45mm diameter and can be fitted flush with the leaf face (provided signage is positioned in leaf framing as detailed in section 7), a minimum of 50mm from any edge.

### 18.18 Surface Mounted Bolts

Surface mounted bolts may be fitted, provided that its installation does not require the removal of any timber from the leaf, stop or frame reveal and it in no way interferes with the self-closing action of the door leaf.

## 19 Door Gaps

For fire resistance applications, door gaps and alignment tolerances must fall within the following range.

Location	Dimensions
Door edge gaps	3mm with a tolerance of $\pm 1$ mm ( a minimum of 2mm and a maximum of 4mm)*
Alignment tolerances	Leaves must not be proud of each other or from the door frame by more than 1mm*
Threshold	10mm between bottom of leaf and top of floor covering*

\* For cold (ambient) smoke control refer to section 24.

## 20 Structural Opening

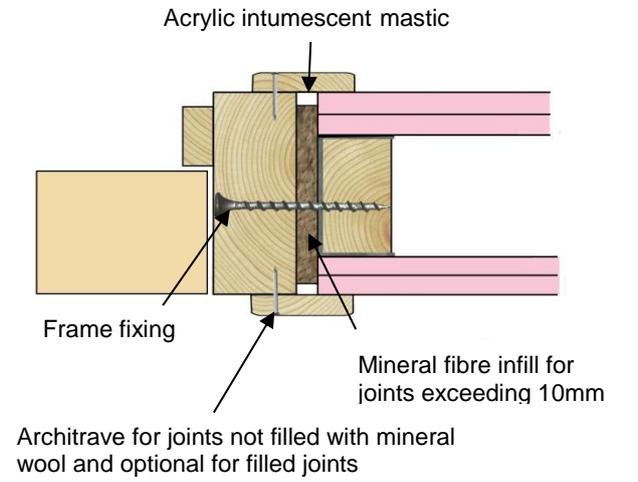
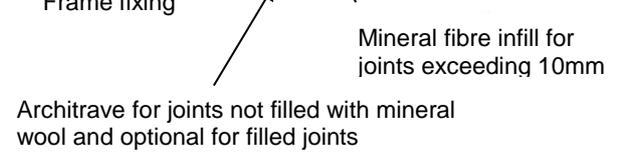
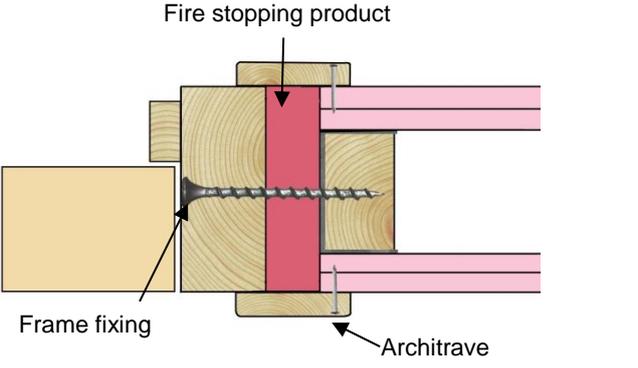
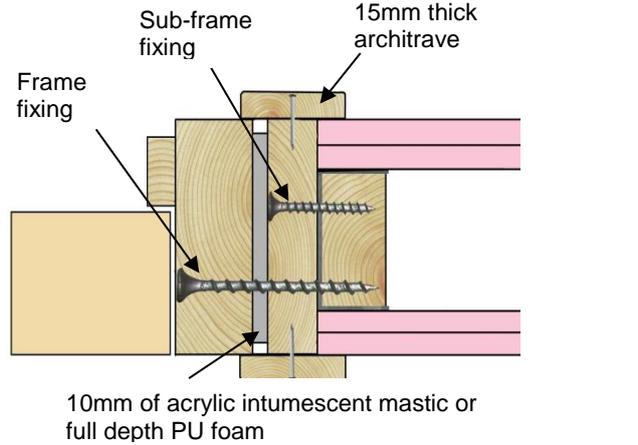
The supporting construction must provide the required level of fire resistance designated for the doorset design and be a suitable medium to permit adequate fixity.

## 21 Fixings

The frame jambs are to be fixed to the supporting construction using steel fixings at 600mm maximum centres. The fixings must be of the appropriate type for the supporting construction and must penetrate to a minimum depth of 40mm. It is not necessary to fix the frame head, although packers must be inserted.

## 22 Sealing to Structural Opening

The door frame to structural opening gap must be protected using one of the following methods.

<p>1. Gaps up to 10mm must be sealed on both sides with a 10mm depth of acrylic intumescent mastic, fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1. Joint must be fitted with 15mm thick architraves overlapping at least 15mm each side.</p>	
<p>2. Gaps between 10mm and 20mm must be tightly packed with mineral fibre, capped on both sides with a 10mm depth of acrylic intumescent mastic, fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1. Architraves are optional.</p>	
<p>3. Gaps up to 20mm filled with proprietary fire stopping product (e.g. expanding PU foam or preformed compressible intumescent foam). Products must be tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1. Joint must be fitted with 15mm thick architraves overlapping at least 15mm each side. <sup>Note 1</sup></p>	
<p>4. Timber based or non-combustible sub-frame up to 50mm thick, with gaps up to 10mm between the components filled on both sides with 10mm depth of acrylic intumescent mastic or full depth expanding PU foam, fire tested for this application to BS 476: Part 22: 1987 or BS EN 1634-1. Joint must be fitted with 15mm thick architraves overlapping at least 15mm each side.</p>	

Note 1: STS90 and AFS expanding foam have been successfully tested for this application.

Guidance for various methods of sealing the frame to structural opening gap is also given in BS 8214: 2016, "*Timber-based door leaf assemblies. Code of Practice*" which may be referred to where appropriate.

## 23 Insulation

Insulation performance may be claimed for Falcon Panel Products Ltd. Strebord® 44 Panelled / Strebord® Superpan Panelled doorset designs meeting the following criteria.

Type	Details
Partially insulating	Doorsets incorporating up to 20% of non-insulating glazing
Fully insulating	Doorsets excluding metal frames and non-insulating glazing or including 30 minute insulating glazing (see section 11.2)

## 24 Smoke Control

### 24.1 General

If the doorset design is required to provide a smoke control function to comply with Building Regulations, in the absence of a suitable pressurisation system, the doorset must meet one of the following criteria:

- (a) have a leakage rate not exceeding  $3\text{m}^3/\text{m}/\text{hour}$  (head and jambs only) when tested at 25Pa under BS 476 *Fire tests on building materials and structures*, Section 31.1 - *Methods for measuring smoke penetration through doorsets and shutter assemblies, Method of measurement under ambient temperature conditions*; or
- (b) meet the additional classification requirement of Sa when tested to BS EN 1634-3: 2004 - *Fire resistance tests for door and shutter assemblies*, Part 3 – *Smoke control doors*.

Smoke seals or combined intumescent/smoke seals that are fitted to the door/frame to achieve the performance requirements specified above, must have been tested in accordance with the associated test method. Providing the smoke seals, any interruptions, door gaps, and the type/configuration of the doorset are consistent with the detail tested, the doorset will comply with current smoke control legislation under Approved Document B; and a suffix 'S' or 'Sa', as appropriate, may be added to the designation. Any other components installed where smoke leakage may occur must also be taken into account.

**Note:** The incorrect specification and fitting of smoke seals may impair the operation of a doorset and therefore compromise the fire resistance performance. Advice should be sought from the seal manufacturers regarding the correct specification and installation of smoke seals or combined smoke and intumescent seals.

#### 24.1.1 Seal Types

Silicon based flame retardant smoke seals (e.g. Lorient IS1212, IS1511, IS7025, IS7060, Norseal 710, Fire & Acoustic Seals FAS35 or Sealed Tight Solutions ST1009) may be fitted to this doorset design without compromising the performance, providing their fitting does not interfere with the activation of the intumescent seals or hinder the self-closing function of the leaves.

#### 24.2 Further Considerations

Note that there is other guidance available, including BS EN 9999-2008 - *Code of practice for fire safety in the design, management and use of buildings*, which may impose different or additional requirements, such as consideration of the gap between door leaf and threshold.

Responsibility for the appropriate smoke sealing specification and performance of the doors should be agreed between the relevant parties (i.e. specifier, manufacturer, contractor) prior to commencing manufacture and/or installation.

## 25 Conclusion

If the Falcon Panel Products Ltd Strebord® 44 Panelled / Strebord® Superpan Panelled door leaf designs, constructed in accordance with the specifications documented in this global assessment, were to be tested in the appropriate configuration in accordance with BS 476: Part 22: 1987, it is our opinion that they would provide a minimum of 30 minutes integrity and insulation, subject to section 23.

## 26 Declaration by the Applicant for WF403039

- 1) We the undersigned confirm that we have read and comply with obligations placed on us by FTSG Resolution No. 82: 2001.
- 2) We confirm that the component or element of structure, which is the subject of this assessment, has not to our knowledge been subjected to a fire test to the Standard against which this assessment is being made.
- 3) We agree to withdraw this assessment from circulation should the component or element of structure be the subject of a fire test to the Standard against which this assessment is being made.
- 4) We are not aware of any information that could adversely affect the conclusions of this assessment.
- 5) If we subsequently become aware of any such information, we agree to ask the assessing authority to withdraw the assessment.

Signed:

Name:

For and on behalf of: FALCON PANEL PRODUCTS LTD.



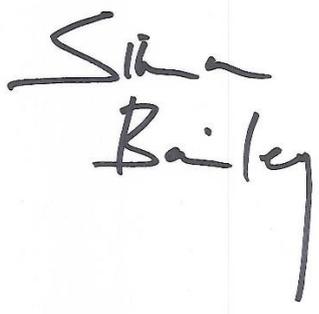
## 27 Limitations

The following limitations apply to this assessment:

- 1) This assessment addresses itself solely to the elements and subjects discussed and does not cover any other criteria. All other details not specifically referred to should remain as tested or assessed.
- 2) This assessment is issued on the basis of test data and information to hand at the time of issue. If contradictory evidence becomes available, Exova Warringtonfire reserves the right to withdraw the assessment unconditionally, but not retrospectively.
- 3) This assessment has been carried out in accordance with Fire Test Study Group Resolution No. 82: 2001.
- 4) Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
- 5) This assessment relates only to those aspects of design, materials and construction that influence the performance of the element(s) under fire resistance test conditions. It does not purport to be a complete specification ensuring fitness for purpose and long-term serviceability. It is the responsibility of the client to ensure that the element conforms to recognised good practice in all other respects and that, with the incorporation of the guidance given in this assessment, the element is suitable for its intended purpose.

## 28 Validity

- 1) The assessment is initially valid for five years from the date of issue, after which time it must be submitted to Exova Warringtonfire for re-appraisal
- 2) This assessment report is not valid unless it incorporates the declaration given in Section 26, duly signed by the applicant.

<b>Signature:</b>		
<b>Name:</b>	<b>S Bailey</b>	<b>A M Winning</b>
<b>Title:</b>	Senior Product Assessor	Senior Product Assessor

## Appendix A Performance Data

### Primary Data

Report No.	Configuration	Leaf Size (mm)	Test Standard	Performance (mins)	
RF09060 (unequal pair)	B: ULSADD	2135 x 932+468 x 44	BS476: Pt 22:1987	Integrity	43
				Insulation	43
RF11160 (single panel leaf)	ULSASD	2131 x 928 x 44	BS476: Pt 22:1987	Integrity	33
				Insulation	33

### Supplementary Data

Report No.	Configuration	Leaf Size (mm)	Test Standard	Performance (mins)
RF02075	A: ULSADD	2100 x 904/300 x 44	BS EN 1634-1	A: 26
	B: ULSASD	2099 x 903 x 44		B: 31
RF10011 (Norfast perimeter sealing system)	A: ULSASD	2740 x 926 x 44	BS 476: Pt 22: 1987	Integrity: 51 Insulation: 51
RF11172 (25mm thick MDF door frames 35mm Bond Up)	ULSADD	2135 x 915 x 43	BS 476: Pt 20/22: 1987	Integrity: 39 Insulation: 39
RF11192 (Strebord® Superpan)	ULSADD	2100 x 903 x 44	BS 476: Pt 20/22: 1987	Integrity: 34 Insulation: 34
RF02110 (Pyroswiss)	A: LSASD	2044 x 825 x 44	BS EN 1634-1	A: 38
WF146520 (Pyroplex air transfer grilles)	Indicative	990 x 900 x 44	Principles of BS 476: Pt 20: 1987	41
WF137714 (Pyroplex glazing system 30054)	Indicative	990 x 900 x 44	Principles of BS 476: Pt 20: 1987	41
FEI08011 (ESG Pyrotech 630 toughened glass)	ULSASD	1020 x 840 x 44	Principles of BS 476: Pt 20: 1987	35
A07051 Rev B (Lorient Palusol & Type 617)	Various	Various	BS 476: Pt 22: 1987	30 & 60
IF12011 (Norsound Vision – softwood beads & square beads with non- insulating glass)	Swinging sample (ULSASD)	1052 x 1020 x 44	Temperature & pressure conditions of BS 476: Pt 20: 1987 & principles of BS 476: Pt 22: 1987	Integrity: 38

**Supplementary Data - continued**

Report No.	Configuration	Leaf Size (mm)	Test Standard	Performance (mins)	
RF11177 (Pilkington Pyroclear)	ULSASD in a glazed screen	2070 x 930 x 44	BS EN 1634-1	Integrity: 32	
IF13014 (Norsound hardware gaskets)	A: LSADD	1268 x 279 x 44	BS 476: Part 20/22: 1987	A: 48	
	B: LSADD	1262 x 279 x 54		B: 69	
IF13061 (Norsound Universal glazing system)	ULSASD	1052 x 900 x 64	Temperature & pressure conditions of BS 476: Pt 20: 1987 & principles of BS 476: Pt 22: 1987	Integrity: 96	
PF14029 (Streframe glazing beads)	A: ULSASD	2040 x 926 x 56	BS 476: Part 20/22: 1987	Integrity	53
				Insulation	53
PF15034 (STS scope)	ULSADD	2900 x 1000/1000 x 44	BS 476: Part 20/22: 1987	Integrity: 33	
CFR1403122 (Therm-A-Seal with large leaves & Therm-A-Bead glazing system)	ULSADD	2440 x 931/931 x 44	BS EN 1634-1	Integrity: 34	
WF341550 (Morland Quickfix glazing beads)	Indicative sample	1380 x 608 x 44	BS 476: Pt 20: 1987	A: 35	
WF342584 (Morland Quickfix glazing beads)	Indicative sample	1380 x 608 x 44	BS 476: Pt 20: 1987	A: 35	
WF316349 (Tectus concealed hinges)	A: ULSASD	1980 x 933 x 44	BS EN 1634-1	A: 34	
	B: ULSASD	1980 x 933 x 44		B: 34	
RF12065 Rev. B (Vistamatic privacy glass)	A: LSASD	2100 x 1140 x 44	BS EN 1634-1 & BS EN 1363-1	A: 30	
	B: LSASD	2100 x 1140 x 44		B: 34	
CFR1603041 (Blue60 fire-stopping foam and packers)	LSADD	2400 1000/1000 44	BS EN 1634-1	Integrity: 64	
FEB/F16012 <sup>7</sup> (Hoppe Concealed closer)	LSASD	2042 x 925 x 54	BS 476: Pt 22: 1987	Integrity: 66	
WF384630 (Cableway & Streframe E)	LSADD	2440 x 1050/400 x 44	BS 476: Pt 22: 1987	Integrity 43 Insulation 43	
WF386959 Rev A (Cableway, Loop, Rutland Concealed Closer, 1520 high Deadlock)	A: ULSASD	2438 x 950 x 44	BS476: Pt 22: 1987	Integrity 32 Insulation 32	
BMT/FEP/ F16187 (Additional MDF Facings)	ULSADD	2135 x 932/932 x 54	BS 476: Pt 22: 1987	Integrity 61 Insulation 61	

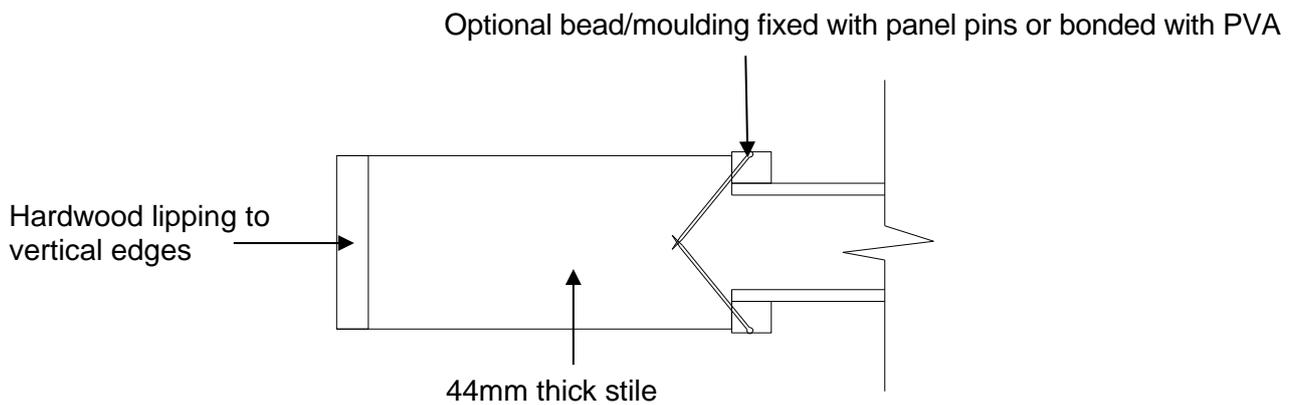
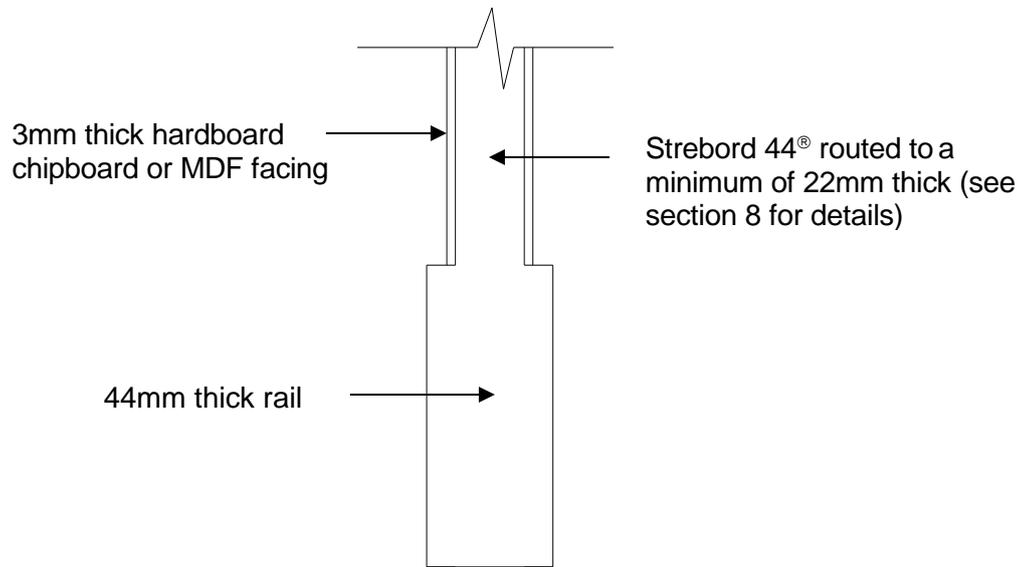
## Supplementary Data - continued

Report No.	Configuration	Leaf Size (mm)	Test Standard	Performance (mins)
CFR1803081-1 (FAS Fire Door Foam)	A: LSASD	2041 x 1101 x 54	BS 476: Pt 22: 1987	A: Integrity: 49 Insulation: 49
	B: LSASD	2013 x 913 x 45		B: Integrity: 43 Insulation: 29
WF389582 (FAS fire Door Foam)	LSASD	2038 x924 x 59	BS EN 1634-1	Integrity: 62 Insulation: 62
WF385685 (ST99 Fire Foam)	ULSADD	2400 x 950/950 x 44	BS 476: Pt 22: 1987	Integrity: 40 Insulation: 40

1. Test RF02075 is used to justify 8mm thick lippings. Although the double leaf failed at 26 minutes, the result of the single leaf and the known relative severity of the European test standard compared to the BS test standard permits us to assess the thinner lippings across the range of assessed doorsets
2. The Pyroplex air transfer grilles in test WF146520 were tested under positive pressure for 30 minutes fire resistance in a section of 44mm thick particleboard door. It has been deemed acceptable for the same products to be fitted at positive and negative pressure locations based on the comparative data generated for 60 minutes fire resistance contained in test WF148053
3. The doorsets tested in IF09145 were positioned in the furnace to simulate both the top and bottom half of a standard size doorset
4. The tested specification of the Norfast sealing system is contained in test report RF10011 and is held in confidence. The tested direction of the seal, with respect to fire exposure, was asymmetric. However, based on the performance of the seal in RF10011 and the leaf size scope given in the relevant data sheet in Appendix E, it has been assessed as being acceptable for use with doorsets that open in either direction
5. For test RF11170, a core density of 520kg/m<sup>3</sup> was measured by Exova Warringtonfire prior to the test commencing. Based on comparison of the distortion figures between test RF11170 and RF09060 and RF07109 it is our assessment the core density range assessed in section 2 is acceptable
6. Test PF14029 has been used to justify Streframe glazing beads. The test was conducted using a 60 minute glazing system and due to the lower density of the timber compared to that normally used for glazing applications, it has been necessary to specify the tested 60 minute glazing system for 30 minute applications. See the main assessment for details
7. Test FEB/F16012 has been used to justify the use of Hoppe concealed overhead closers, see section 18.3.1 for details.

## Appendix B

### Panel Construction Diagrams



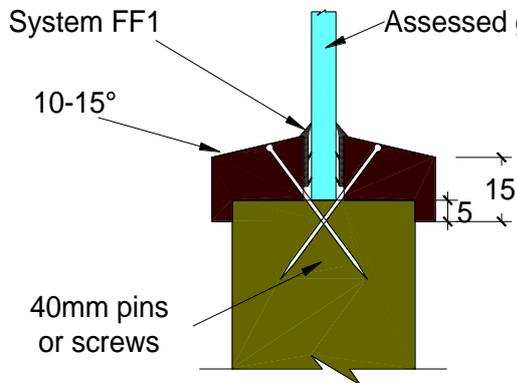
## Appendix C

### Revisions

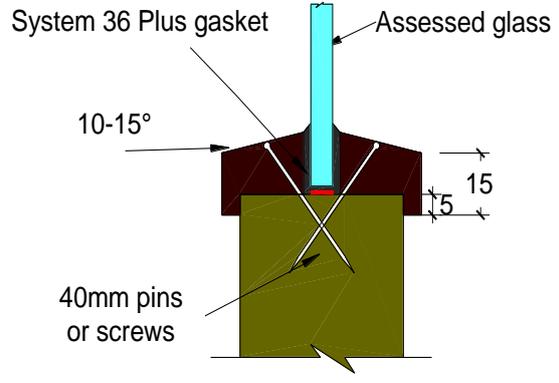
Revision	Exova Warringtonfire Ref.	Date	Description
A	A09104	04.03.2010	Assessment revised to include MDF frames and larger glazed apertures.
B	12119	10.10.2012	Assessment revised to include a single panel design, reduction of panel core thickness to 22mm thick, updated density range for Strebord, inclusion of additional glazing systems, reduced thickness of door frames, identification discs, reduction in density of lippings and timber door frames, maximum 19mm thick lippings, and additional glass types
C	WF403039	01.08.2018	5 year revalidation and format update. Addition of core makeup options, addition of STS and FAS45 seals, additional smoke seals, cableway options and PU foams for firestopping.

## Appendix D

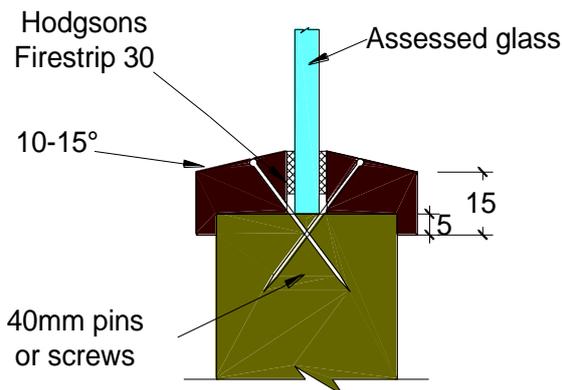
### Proprietary 30 Minute Glazing Systems



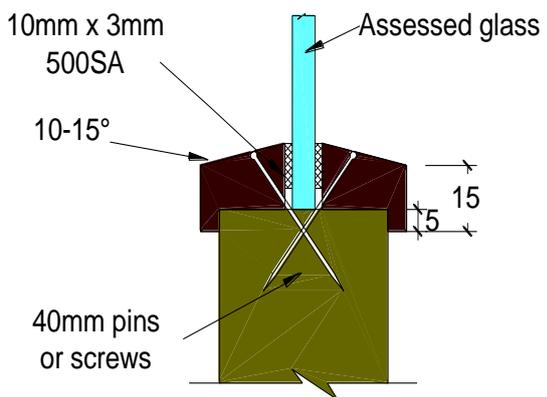
**System FF1**  
Lorient Polyproducts Ltd



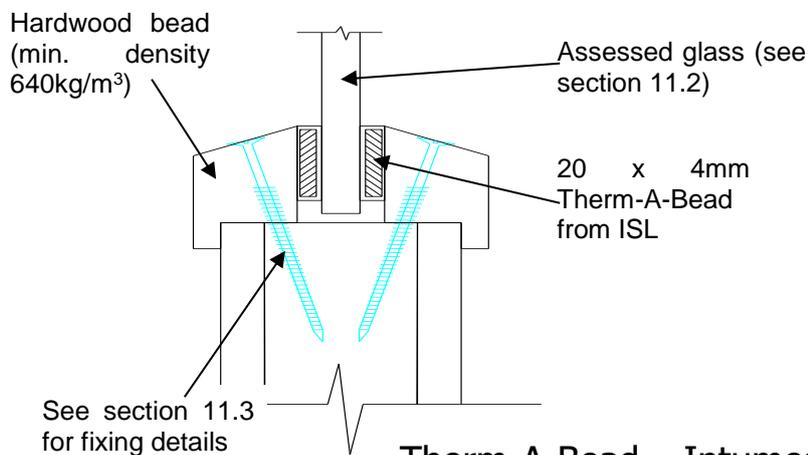
**System 36 Plus**  
Lorient Polyproducts Ltd



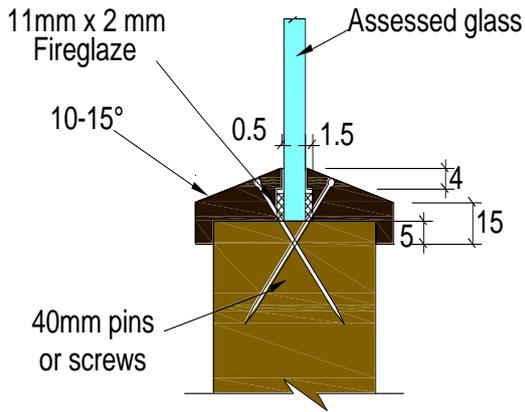
**Firestrip 30**  
Hodgsons Sealants Ltd



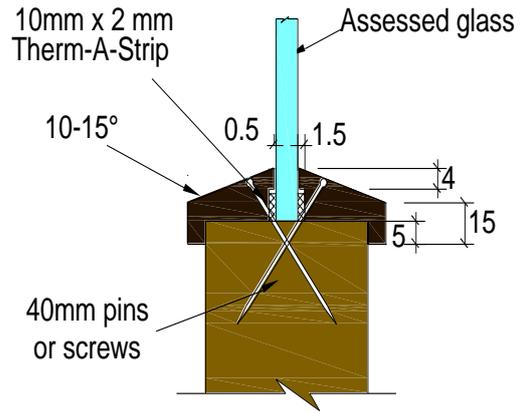
**Pyroglaze 30**  
Mann McGowan Ltd



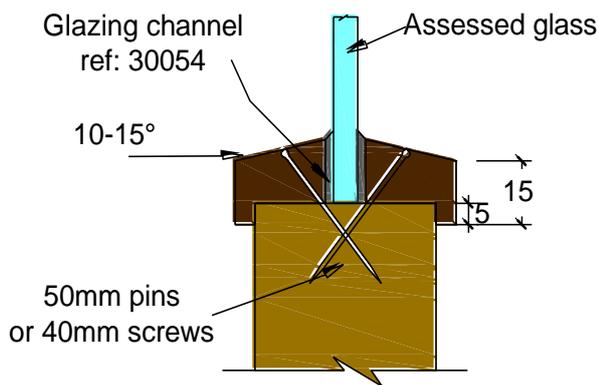
**Therm-A-Bead – Intumescent Seals Ltd.**



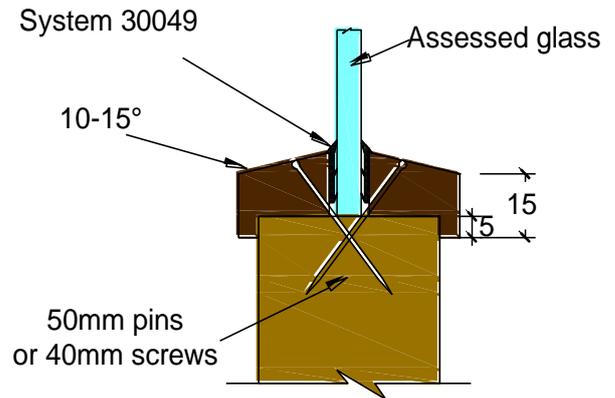
**Fireglaze**  
 Sealmaster Ltd



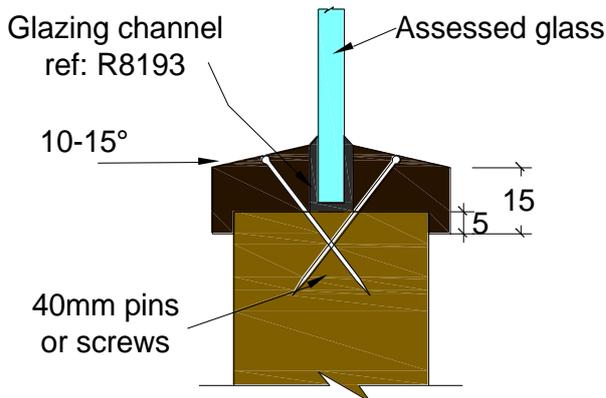
**Therm-A-Strip**  
 Intumescent Seals Ltd



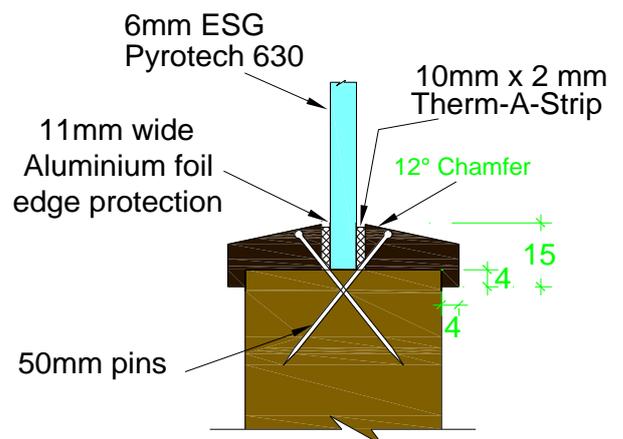
**Pyroplex Ltd**



**Pyroplex Ltd**



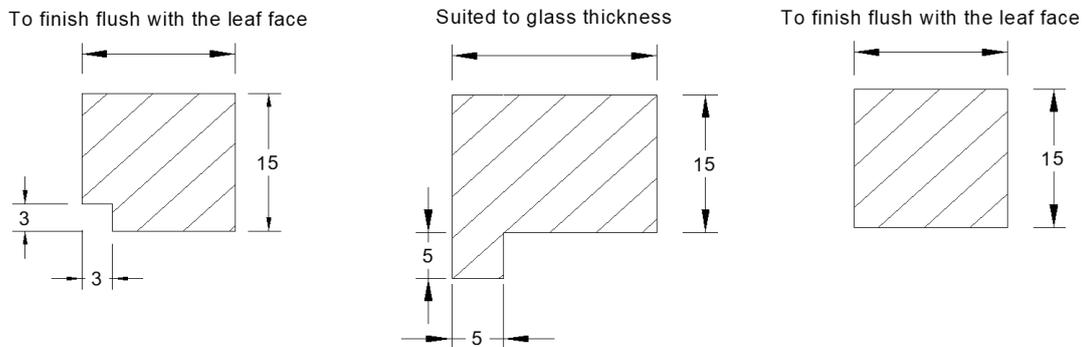
**Pyroplex Ltd**



**Glazing system required for use with  
 ESG Pyrotech 630 Glass**

### Assessed Square Glazing Bead Profiles

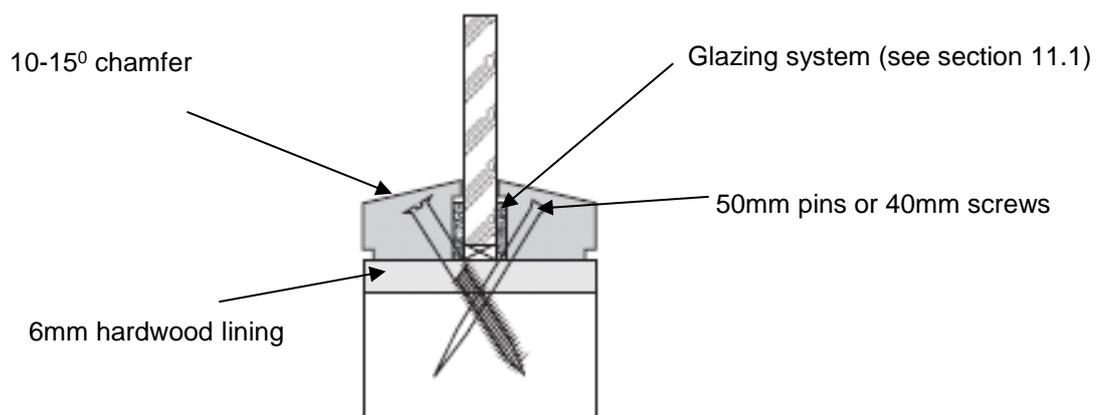
The following square bead profiled may be used as an alternative to the splayed beads detailed above in the glazing system diagrams above - refer to section 11 for glazing system and glass restrictions.



### Splayed Flush Bead Option

A splayed, flush, bead may be used with glazing systems approved for use with square beads in section 11 subject to the following:

1. The aperture must be lined using  $\geq 6\text{mm}$  thickness of hardwood of  $\geq 640\text{kg/m}^3$  density
2. The bead must be  $\geq$  to 15mm high, with a 10 - 15° chamfer
3. A rebate not exceeding 2 x 2mm may be used to the bead or lining to accommodate door thickness tolerances
4. The diagram below depicts the assessed system:



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F: +44 (0) 1494 564 895  
E: [globalfire@exova.com](mailto:globalfire@exova.com)  
W: [www.exova.com](http://www.exova.com)



Testing, calibrating, advising.

## Appendix E

Data Sheets for:

**Falcon Panel Products Ltd.**

**Strebord® 44 Panelled / Strebord® Superpan Panelled  
30 Minute Fire Resisting Doorsets**

## Strebord 44® Panelled Doorsets - Pyroplex Seals

Latched and Unlatched, Single and Double Acting, Single Leaf Doorsets

	Configuration		Height (mm)	Width (mm)
Leaf Sizes	LSASD	From:	2135	x
		To:	2979	x
	ULSASD & DASD	From:	2135	x
		To:	2929	x
Maximum Overpanel height (mm)		Transomed	2000	

**Intumescent Materials: Pyroplex Rigid Box Seal PVC Encased Graphite**

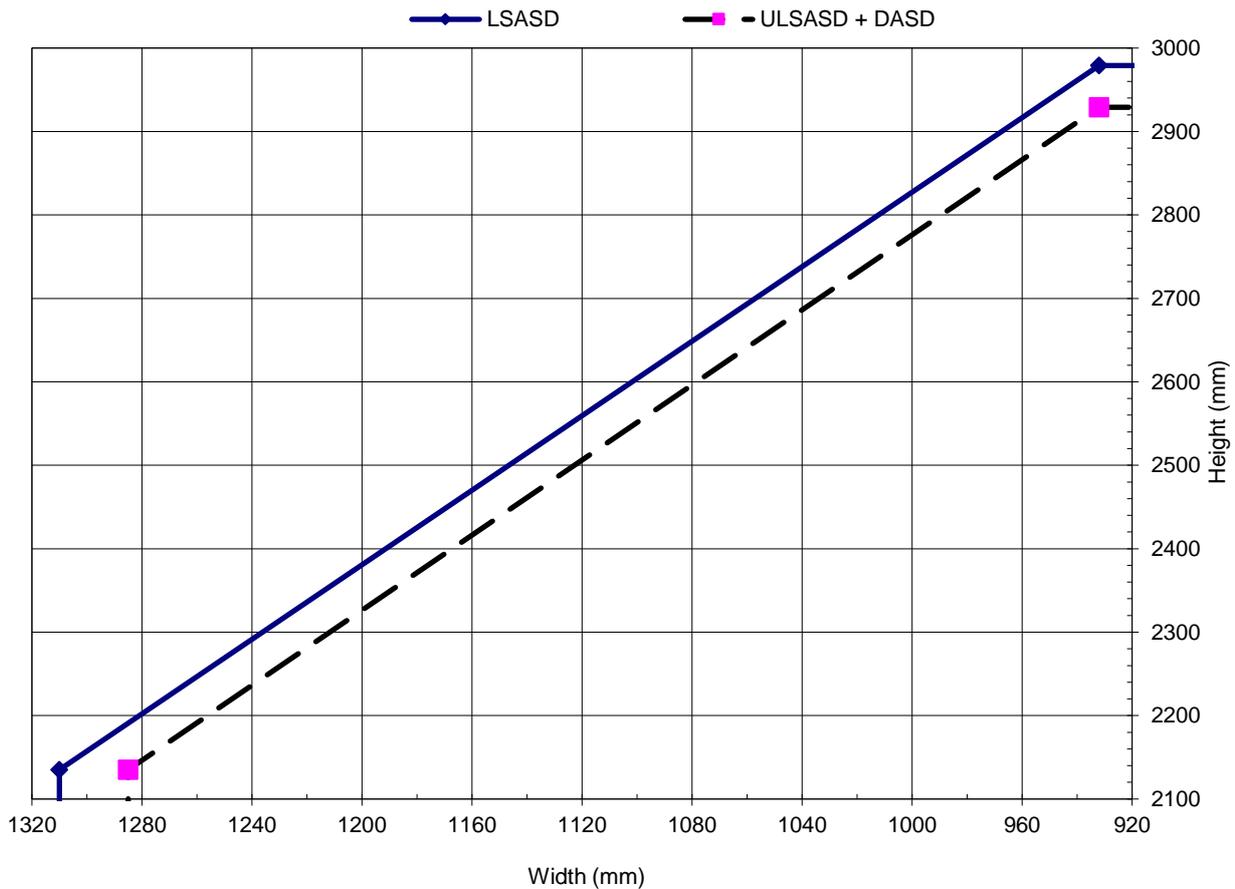
**Head:** 1 No. 15 x 4mm strip exposed and fitted centrally in the leaf edge or frame reveal. Increase seal to 20 x 4mm on doorsets over 2300mm high.

**Jamb:** 1 No. 15 x 4mm strip exposed and fitted centrally in the leaf edge or frame reveal. Increase seal to 20 x 4mm on doorsets over 1075mm wide.

**Hardware Protection:** see section 14

**Note:** Intumescent protection is required under the hinge blades on both leaf and frame on door leaves over 2440mm high.

**Maximum Door Leaf Size**



## Strebord 44® Panelled Doorsets Doorsets - Pyroplex Seals

Latched and Unlatched, Single and Double Acting, Double Leaf Doorsets

Leaf Sizes	Configuration	Height (mm)		Width (mm)	
		LSADD	From:	2135	x
To:			2879	x	932
ULSADD & DADD		From:	2135	x	1235
		To:	2829	x	932
Maximum Overpanel height (mm)		Transomed	1500		

**Intumescent Materials: Pyroplex Rigid Box Seal PVC Encased Graphite**

**Head:** 1 No. 15 x 4mm strip exposed and fitted centrally in the leaf edge or frame reveal. Increase seal to 20 x 4mm on doorsets over 2300mm high.

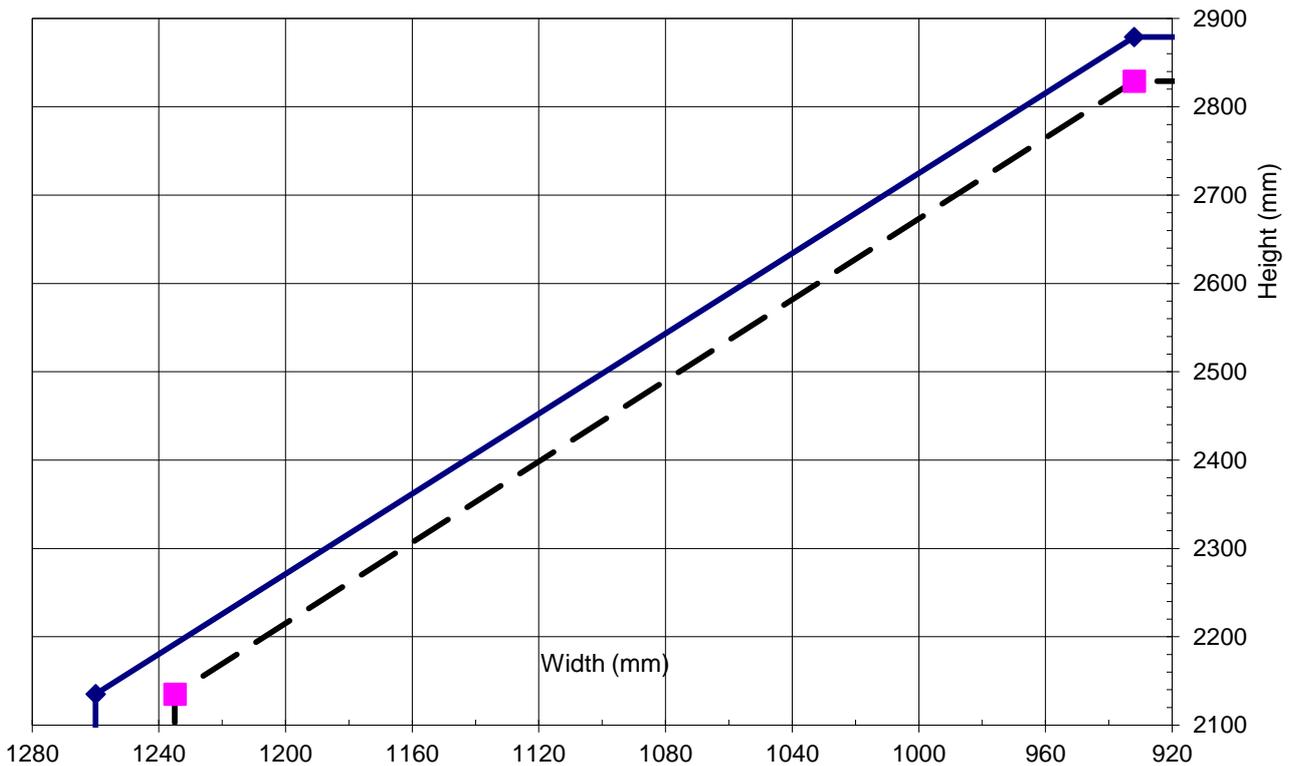
**Meeting Edges:** 1 No. 15 x 4mm strip exposed and fitted centrally in one leaf. Leaves over 1050mm wide increase to 1 No. 20 x 4mm.

**Jamb:** 1 No. 15 x 4mm fitted centrally in the leaf edge or frame reveal. Increase seal to 20 x 4mm on doorsets over 1075mm wide.

**Hardware Protection:** see section 14

**Maximum Door Leaf Size**

—◆— LSADD     
 -■- ULSADD & DADD



**Strebord 44® Panelled Doorsets – All Seal Types**  
 Latched and Unlatched, Single and Double Acting, Single Leaf Doorsets

	Configuration		Height (mm)	Width (mm)
Leaf Sizes	LSASD, ULSASD & DASD	Maximum Leaf Dimensions	2040 x 926	
Maximum Overpanel height (mm)		Transomed	2000	

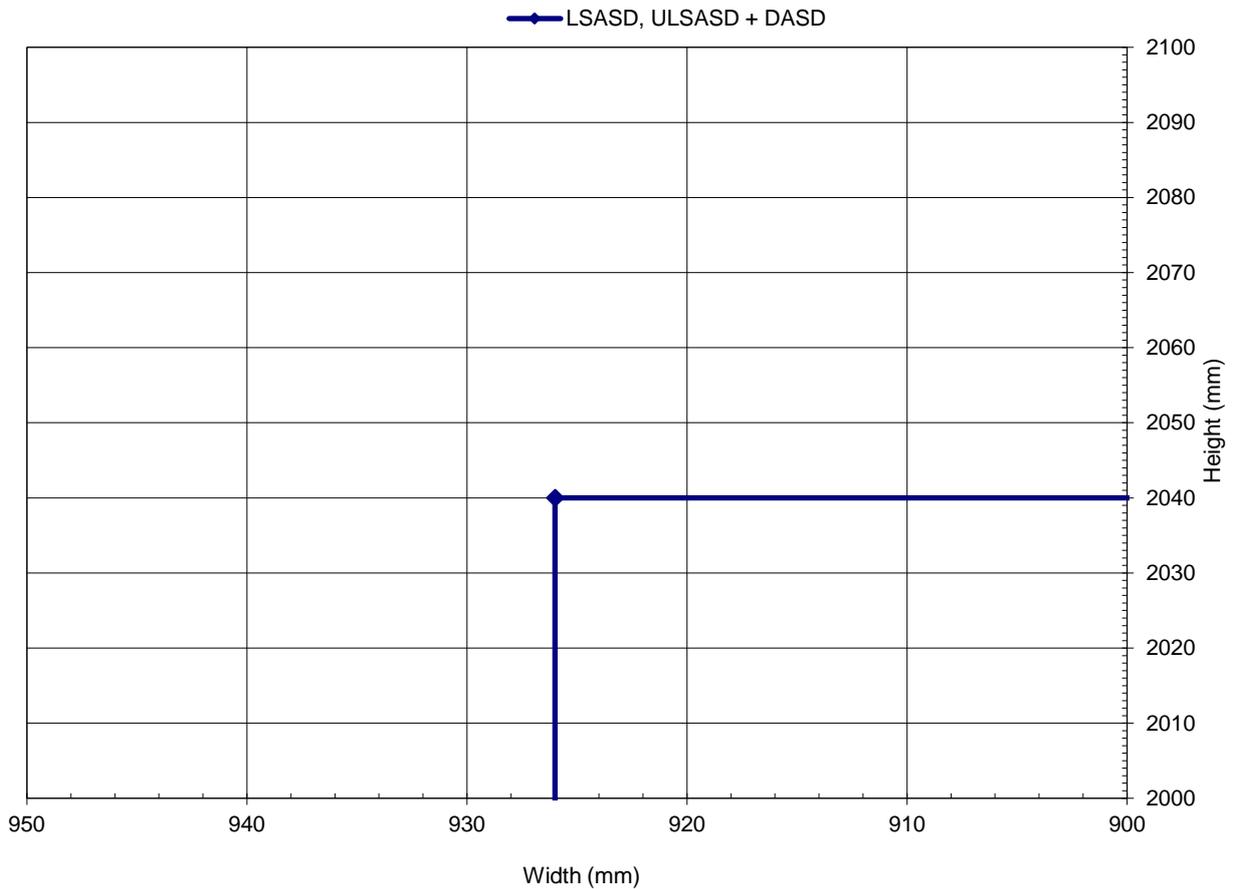
**Intumescent Materials: All PVC encapsulated Seal Types assessed in Section 14: Palusol100, Therm-A-Seal, Type617, STS Fire or FO154**

**Head:** 1 No. 15 x 4mm strip exposed and fitted centrally in the leaf edge or frame reveal.

**Jamb:** 1 No. 15 x 4mm strip exposed and fitted centrally in the leaf edge or frame reveal.

**Hardware Protection:** see section 14

**Maximum Door Leaf Size**



**Strebord 44® Panelled Doorsets – All Seal Types**  
 Latched and Unlatched, Single and Double Acting, Double Leaf Doorsets

Leaf Sizes	Configuration	Maximum Leaf Size	Height (mm)	Width (mm)
	LSADD, ULSADD & DADD		2040 x 926	
Maximum Overpanel height (mm)		Transomed	1500	

**Intumescent Materials:** All PVC encapsulated Seal Types assessed in Section 14: Palusol100, Therm-A-Seal, Type617, STS Fire or FO154

**Head:** 1 No. 15 x 4mm strip exposed and fitted centrally in the leaf edge or frame reveal.

**Meeting Edges:** 1 No. 15 x 4mm strip exposed and fitted centrally in one leaf.

**Jamb:** 1 No. 15 x 4mm fitted centrally in the leaf edge or frame reveal.

**Hardware Protection:** see section 14

**Maximum Door Leaf Size**

—◆— LSADD, ULSADD & DADD

